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Addresses and Essays

BY

G. FRANK LYDSTON, M. D.

ADDRESSES AND ESSAYS.

LYDSTON.

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— BY —

G. FRANK LYDSTON, M. D.,

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Published by

RENZ & HENRY,

LOUISVILLE, KY.

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....TO....

WILLIAM E. QUINE, M. D.,

PROFESSOR OF THE PRINCIPLES AND PRACTICE OF MEDICINE AND CLINICAL MEDICINE IN THE CHICAGO COLLEGE OF PHYSICIANS AND SURGEONS,

IN TESTIMONY OF APPRECIATION OF HIS GREAT ABILITY AS A TEACHER AND CLINICIAN, AND AS A TRIBUTE OF PERSONAL ESTEEM THIS BOOK IS RESPECTFULLY DEDICATED BY

THE AUTHOR.

PUBLISHERS PREFACE.

In presenting this collection of Prof. Lydston's Addresses and Essays to their professional friends, the publishers trust that the work will be more acceptable as an addition to the library than a cut and dried text book. Every practioner is supposed to be provided with treatises upon the various branches of medicine, and it is hoped that the more thoughtful of the profession will be more favorably inclined toward a volume of original essays than an ordinary medical treatise which would be but a repetition of what their libraries already contain.

PREFACE TO THE SECOND EDITION.

The present volume contains in a revised and enlarged form a series of essays, addresses and lectures published in various quarters for several years past. The first edition was received so kindly by the profession that the author has been encouraged to publish a more pretentious volume. The essay on Sexual Perversion has been added chiefly because of the great interest which was taken in the original article, as manifested by numerous requests for reprints which have been received. The author has been pleased to note that during the active discussion upon sexual perversion which has been excited by recent sensational murders by sexual perverts, the classification contained in his essay has been quite extensively adopted. The author is especially gratified to observe that Dr. J. G. Kiernan, one of the ablest of American alienists, has recently accepted the classification although he criticised it when it was first published. The essay upon Criminal Crania is but a fragment of a work now in preparation and is necessarily incomplete. The article on Varicocele comprises a paper presented to the Southern Surgical Association in 1890, and is an excerpt from a recently published complete monograph upon the subject.

Opera House Block, Chicago,
September 1st, 1892.

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THE EVOLUTION

—OF THE—

LOCAL VENEREAL DISEASES.

It was invariably taught until quite recently that the viruses of chancroid and gonorrhœa were specific entities which were always and invariably the same, their inoculation being followed under all circumstances by similar and typical results. Indeed I myself accepted this view so confidently that it is with some hesitancy that I will endeavor to present views that are diametrically opposed to those which I formerly believed to be correct. When Drs. Taylor and Bumstead, in their excellent work upon the venereal diseases, advocated the doctrine that the chancroidal virus was not a specific entity, and that chancroidal ulcerations differed in degree only, rather than kind, from ulcers of a simple character, there were very few, indeed, who did not antagonize their views. It is only within a very short time that I have been convinced, from observation and experience, that chancroid and gonorrhœa are diseases which may arise *de novo*, and which, in the true sense of the term, are not specific. It appears to me that it is only by the acceptance of this theory that it is possible to understand something of the origin of chanchroid and gonorrhœa, and which we certainly cannot do under the old and generally accepted doctrine of specificity.

While we may not be able to positively demonstrate the origin of the poisons of all infectious dis-

* Address before the St. Louis Academy of Medicine

eases, it is difficult to comprehend that a "specific" poison has always existed in any case, and it is certainly a great step in the advancement of medical science when we became able to trace the poison of any particular specific disease to its source. We have not been able to do this with many diseases, for it is fully as difficult to understand the circumstances under which certain morbid entities affecting the human body sprang into existence, as it is to comprehend the precise conditions under which vitality itself first made its appearance in matter hitherto inert. A few of the morbid conditions affecting animal life have fortunately been traced to their origin, and, through the germ theory, we have at last begun to see a little light in regard to the origin of infectious diseases. Even at the present day, however, very few scientists are looking in the proper direction for the origin of disease, for if we admit that the germs of disease are living entities, why is it not logical for us to bring to bear upon them the same laws of evolutionary progression, differentiation, and development that we now apply to all other living creatures?

Disease is incident to the life of every animal, and as we study the evolution of the a mal, so should we study the evolution of its diseases. Every phase of animal development and progression is subject to adverse elements of various kinds: thus each animal is relentlessly pursued by foes of a higher or lower evolutionary development. Man, with his superior power born of knowledge, has been able to contend successfully with all of those elements which are inimical to his welfare, with the exception of those apparently insignificant little organisms—the germs of disease. As man himself has become differentiated through varying circumstances of environment, so have his foes become differentiated; hence he has become more susceptible to the inroads of certain forms of disease-germs, but less susceptible to others; certain varieties of germs have become extinct, while new forms have been developed; others, again, have become so modified as to bear almost no resemblance to the parent stock. By pursuing this line of study

we may eventually find that many diseases which are now apparently quite dissimilar, have become so by the differentiation of the germs upon which they depend, and perhaps may discover the circumstances which have brought about such differentiation.

In applying this theory to chancroid, I first desire to call your attention to a few analogical arguments that are certainly striking. We will take as our point of departure diseases of a known or alleged specific nature, and see if we cannot find elements in two forms of the same disease which are more dissimilar than are simple genital ulcers and chancroid. In small-pox we note several degrees of severity, from a varioloid, in which there perhaps exists but a single pustule, to the variola hæmorrhagica, or maligna, which is so fatal to life. The resemblance between these two extremes is very slight, yet they are the same disease. Or, to go still farther, note the difference between small-pox and vaccinia. Not much resemblance between the two you will admit, yet the poison of the latter is a derivative of the former, and by its action the human system is rendered insusceptible to the attacks of its more vigorous and noxious ancestor.

In scarlatina we have all grades of severity, from the walking form, in which one would hardly know that the child is ailing, to the scarlatina anginosa, or maligna, in which the life of the little victim is so rapidly destroyed. A singular fact is that in the severe forms of scarlet fever the angina assumes characteristics so severe, and of so peculiar an appearance, that the doctor is sometimes impelled to say, "This child also has diphtheria." Do you believe that the system of the child could be a field for strife between two infectious constitutional diseases of so pronounced a type? I do not; but I am convinced that these cases are an illustration of the manner in which certain diseases, supposed to be separate and distinct, are co-related; and, furthermore, of the possibility of their development *de novo*.

Typhoid and typhus fevers have numerous degrees of severity, the extremes of which are strikingly dis-

similar, although the *materies morbi* is invariably the same in each instance. We know, too, that typhoid and typhus fevers may develop *de novo*, under favorable circumstances of environment.[1]

Malarial fevers vary in severity from a slight ague shake followed by fever to the pernicious type which speedily destroys life. Clinically, malarial and typhoid fevers are frequently confused.[2]

Septic infection in surgical diseases may result in one of several degrees of severity of blood-poisoning, from the slight febrile disturbance, which was formerly termed "traumatic fever," to the overpowering and speedily fatal septæmia, which is so nearly identical to snake-bite in its effects upon the blood. Interposed between the two we have acute and chronic pyæmia. These phases of disease differ widely, yet they are one and the same, and due to the same cause.[3] Erysipelas is a disease which may vary in type from the slight form of inflammation which is hardly more than an erythema, to such a severe form as that which sometimes affects the scrotum, and not only causes sloughing but often a fatal result. Can we detect the slightest resemblance between the two? I think not; yet they are the same disease. Inoculate your finger with blood drawn from a patient with erysipelas of the face, and you may escape erysipelas entirely; if you do not it is apt to occur in a mild form. If, on the other hand, you inoculate yourself with the secretions from a sloughing scrotum, and you do not die of septæmia, the least you can expect is phlegmonous erysipelas of a severe and dangerous type.

I would also call to your attention the vast differences which exist between the different forms of puerperal disease; thus, we meet with cases of peritonitis, cellulitis, phlebitis, and acute fatal septæmia,

[1] This was strikingly illustrated by the epidemic of typhus fever which occurred in New York in 1880-81.

[2] When absorbed by the lungs hospital miasm has been known to produce effects closely resembling malarial poisoning, and curable by quinine.

[3] With due deference to the recently published papers of Dr. Senn upon pyæmia, in which if I interpret him correctly, an opposite view is expressed.

all due to the varying conditions and effects of the same *materies morbi.*

Further illustrations are, perhaps, unnecessary, but I must not omit the most important analogy of all, viz., diphtheria: Recent observations of a clinical character have shown us that the diphtheritic virus, germ, influence, or whatever you may choose to term it, is capable of producing many different phases of disease of the naso-pharynx, varying from a slight and, apparently, simple sore throat with little or no constitutional symptoms (catarrhal diphtheria), to an exudative malignant affection capable of rapidly destroying life, and invariably producing the most profound constitutional disturbance. We know that epidemics of simple sore throat are closely associated with epidemic diphtheria. With the coming and going of an epidemic of diphtheria especially, as well as during its maximum dissemination throughout a community, we observe many cases which, while they do not present the typical characters of diphtheria and the diphtheritic micrococcus cannot be found in the pharyngeal secretions,[1] are nevertheless due to the same influences as diphtheria proper. When diphtheria exists in a family of several persons, it is often observed that apparently simple sore throat will appear in some members of the family while others are affected by genuine diphtheria, and that the simple cases often become transformed into the more malignant type. Physicians in attendance upon cases of diphtheria are often affected by sore throat of greater or less severity; this being my own experience whenever I attend cases of this character for any length of time. A defective drain has been known to affect different members of the same family with morbid conditions of the throat, varying from trifling soreness to malignant diphtheria, and also with varying types of essential fever.[2]

[1] Some of the more recent investigations tend to show that there are several forms of micro-organisms found in diphtheria, none of which are characteristic, and all of which are found upon the normal mucous membranes.

[2] Lee, Dr. L. J. W.: Influence of Diathesis upon Contagion. New York Medical Record, vol. xxv, No. v, p. 84.

I have mentioned these many facts, which are apparently so foreign to the subject of chancroid and gonorrhœa, to demonstrate the varying results which may be produced by the evolution of the same poison.

Now, what is the reason that these so-called specific poisons manifest themselves so differently under apparently identical circumstances? Simply a varying virulency of the poison upon the one hand, and varying susceptibility upon the other, these variations being comprehensible to me only upon the hypothesis of evolutionary changes in the germ as well as in its field of action, *i.e.*, the human system. Let us consider this hypothesis, and see if the variation of the phenomena of disease is not dependent upon a variation in what has heretofore been considered an unvarying entity—a specific germ—and if even the noxious or poisonous property of the germ may not be an ingraft upon it, or at least a matter of development. Let us take as our first point of departure those innocent germs, cocci, or, if you please, minute organized particles which everywhere exist in the atmosphere. These germs multiply by their own peculiar methods of procreation, and such multiplication is favored or opposed, as the case may be, according to their environment. Filth, heat, and moisture, and protection from air and light, favor the development of many such organisms. It is obvious that successive crops of germs are possessed of properties which diverge more or less from those of the parent stock. This is a universal law that applies to all living organisms. The newly acquired properties are modified or varied according to varying circumstances of environment. Whether it is the germs proper, their secretions or excretions, if such there be, or new and complex compounds produced by their action upon putrescible matter,[1] that produce their peculiar effects upon organisms more highly differentiated than themselves, it would be difficult to determine, but it is at least conceivable that, sooner or later in the process of

[1] Ptomaïnes or leucomaïnes.

evolution, germs are developed which are possessed of properties by virtue of which they are capable of producing definite effects upon the human system. Thus we have, by evolution, the spontaneous generation of so-called specific poisons. Now, do not understand me to say that the germs themselves are spontaneously developed, for while such an event is perhaps possible, it is as yet disputed by the best scientific authorities. What I do claim is, that the poison of disease may be developed by the evolution of, and acquirement of new and toxic properties, by germs which were primarily innocuous.

Having arrived at a stage of development when it is capable of producing definite morbid effects upon the system, we might suppose that this germ would cause invariably similar effects upon the human economy. But the law of evolution still follows the germ of disease in its tour of mischief, and as I have attempted to show you from a clinical standpoint, modifies the resulting phases of disease most markedly, independently of the special properties of the individual germ.

The conditions modifying the results of germ infection are, as nearly as I can understand them, as follows:

1. The degree of virulency and vitality of the germ at the time it enters the tissues or blood of a human being.

2. The inherent vitality of the individual, or his resisting power at the time of infection.

3. Individual susceptibility to the particular disease represented by the germ, *i. e.*, idiosyncrasy.

4. The condition of the eliminative apparatus of the person affected.

5. If the disease germ has a special predilection for any particular tissue the result will be modified by the condition of that tissue at the time of its infection, *e. g.*, the typhoid bacillus and the comma bacillus of cholera Asiatica most readily affect those who have morbid conditions of the alimentary canal. Diphtheria is most apt to attack persons with acute or chronic naso-pharyngeal disease.

6. And one of the most important of all, the number of germs and the length of time during which the patient is exposed to their influence.[1]

Although not usually attributed to evolutionary laws, some of these ideas in relation to the development of infectious diseases are already pervading the profession to a slight extent. Probably the nearest approach to a thorough exposition of the subject is an essay by Dr. De Gorrequer Griffith, of London, entitled the "Unity of Poison."[2] In this article the learned author has shown quite plainly the corelation of certain infectious diseases formerly supposed to be separate and distinct affections.

Now to attempt the application of this theory of the spontaneous development of specific poisons to the development of the viruses or germs of the local venereal diseases:

The idea that the chancroidal poison is one which has always been inseparable from the human species, is of course untenable. Somewhere along the line of our ancestry chancroid appeared, but at what time history does not tell us. The human race in general must have begun existence with a considerable capital in the form of a healthy organization, and every disease which now affects unfortunate humanity must necessarily have developed since the species originated. As the races have become differentiated, or have diverged, new circumstances of environment have been encountered which have modified the organism of the human being, and in the course of evolutionary progression many and various diseases have arisen.

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[1] Virchow has shown this to be eminently true of septæmia.

[2] Midland Medical Miscellany. As expressed by Griffith, this theory implies "the unity of poison and differentiation of resultant phenomena which we call symptoms—not because of any difference in the poison which may be the *origo mali* of so-called various diseases, but differentiations dependent upon the media through which the poison passes, or upon which it falls, the evolutions and development of that one poison being marked by new phases, new manifestations to which rightly we should not apply the expression 'separate diseases,' but rather call them simply what they are, the various expressions of the evolutions of that unity of origin, whatever it may be, which has set then all agoing."

This fact has been due to—

1st. The appearance upon the scene of weaker and more susceptible organizations than those of the parent stock.

2d. Changes of telluric and climatic influences.

3d. Injuries and vicissitudes experienced in the struggle for existence, modifying the organisms of numerous individuals, such modifications being transmitted to their descendants.

4th. Varying character and quantity of food and drink, alcoholics within a considerable number of generations having exerted a marked influence.

5th. Varying sanitary circumstances, involving crowd poison and other forms of noxious and contaminating animal matter.

6th. Varying personal hygiene, involving cleanliness, exposure to cold and wet and other influences which may modify individual constitutions. The question of sexual habits here enters into consideration and is necessarily of special importance in its bearing upon the evolution of the venereal diseases.

7th. The gradual and certain evolution and differentiation of, and acquirement of new properties by, living germs.

So much for the acquirement of disease in general.[1] Gonorrhœa and chancroid have probably arisen in a manner precisely similar to the evolution of other infectious diseases, and while it is premature to say that the poisons of the two diseases are precisely identical, I am firmly convinced that they are differ-

[1] Independently of the existence of the living germ, attention may be called to the generally unappreciated fact that all poisons act upon the animal body in accordance with physiological laws. The physician speaks of the physiological effects of his drugs, but strange to say, never of the physiological effects of the *materies morbi* of disease. The effects of poisons vary; thus, opium gives a wide range of results, from nervous stimulation to fatal coma, aconite varies in its effects from moderate sedation to cardiac paresis, malarial poison (or germs) from slight depression of the vital functions to fatal coma, and so on, ad infinitum. Again, some poisons have a local as well as constitutional effect, the local changes which they produce being also purely physiological. The science of medicine will never become philosophical until these facts are generally both appreciated and applied.

ent in degree rather than kind, and of a similar origin to say the least. We are not lacking in authorities who believe them to be precisely the same. Dr. R. W. Taylor is one of the leading authorities who claim that chancroid is not a specific disease in the sense that we speak of variola, and that, moreover, its poisonous secretion is precisely the same as that of gonorrhœa. Dr. F. R. Sturgis also holds this view.

The origin of gonorrhœa and chancroid must necessarily be the same, if the evolutionary theory of their origin be correct. The vagina of the female is as excellent a nidus or hotbed for the generation of poisons as could be well imagined, and when we consider the large number of women who are affected by uterine or vaginal diseases, it is a matter of wonderment that the venereal affections are so few in number and manifestations.

There exists, even in perfectly healthy women, the circumstances of heat, moisture, protection from air and light, and the occurrence very often of local irritation in the form of excessive cohabitation. Superadd to these normal or quasi-normal conditions a suitable pabulum for the development of germs in the form of uterine or seminal discharges, and we are apt to have conditions decidedly detrimental, not only to the woman herself, but to the generative organ of any one with whom she may chance to have sexual congress.

Few women are free from disease; indeed, the woman who is perfectly sound is a *rara avis*, and in the uterine discharges bacteria may develop and wax fat. Many women, through ignorance in some cases, through natural physical indifference in others, are exceedingly unclean, and allow both natural and unnatural secretions to accumulate until the condition of their sexual organs is indeed filthy. This is especially the case in the low class prostitute, and unfortunately is often the case among women who are respectable or quasi-respectable. As has been remarked by others, in connection with the subject of urethritis and chancroid, the high-toned prostitute is not so open to impeachment upon the score of uncleanliness as those of a lower grade. In a general

way it may be said that if every man could view for himself the actual condition of most of the women of easy virtue with whom he is brought in contact, there would be a decided improvement in the moral tone of the community. I may also add, that with the present unhealthy manner of living in vogue among the fair sex, many young men would give up all romantic ideas of matrimony, if they could but inspect the object of their ambition through the speculum of the gynæcologist. So much for uncleanliness and disease, independent of the question of virtue and morals.

As the circumstances of uncleanliness, unhealthy secretions, local irritation, heat, moisture, and deprivation of free air and light favors the development of germs, and particularly those of decomposition, it may be readily understood that after a time such a bacterial development actually takes place in the vaginæ of some women. The innocuous germs of the atmosphere enter, and begin their work of procreation or multiplication in an environment scanty in its supply of oxygen,[1] decomposition occurs, and *pari passu* with its new germs appear upon the scene which differ from the parent stock; and so the process goes on until a very irritating poison is developed. If during this time, the discharge from a diseased urethra be added to the noxious materials, or if semen be deposited in this hot-bed of putrefaction, so much the better for the development of a "specific" poison. Selmi and Gautier have shown that poisonous alkaloids develop from putrefaction, and it is to these poisonous substances or ptomaines that I am inclined to attribute the trouble in gonorrhœa and chancroid. The decomposition of semen is especially likely to produce such a poison. If this be correct, it is to the products of the bacteria, rather than to the bacteria

[1] "The experiments of Pasteur on chicken cholera are well-known. In hope of diminishing the infective power of this organism, he grew it in oxygen for a long time, and found not only that it produced a modified disease, but that this attack in most cases protected the animal from the effect of the organisms in their most virulent state!"—British Medical Journal, December 31, 1881, p. 1062.

themselves, that we must attribute the results of chancroidal and gonorrhœal secretions. It is, therefore, assumed that while bacteria may be present in cases of gonorrhœa and chancroid, they are by no means necessarily so. This would explain why scientific observers have found bacteria or cocci in some cases, while they have been unable to do so in others. The varying degree of acridity and quantity of ptomaines, and the varying susceptibility of mucous membranes would explain the differences which appear to exist between gonorrhœa and chancroid, as well as between mild and severe types of the same disease.[1]

Now as to the conditions which modify the results of the virus generated *de novo* in the human vagina. These are as follows :

1st. It is obvious that much depends upon : *a*, the age of the decomposition ; *b*, the degree of inflammation present ; *c*, the frequency of coitus ; *d*, the constitution and habits of the woman ; *e*, the character of any semen or urethral discharges which may be deposited in the vagina ; *f*, the degree of cleanliness of the woman.

2d. The amount and degree of virulency of the virus deposited upon the absorbent surface in another individual.

3d. The cleanliness, local and constitutional condition, habits and sexual hygiene of the recipient of the cultivated virus.

4th. Individual predisposition.

With reference to the latter point, Dr. Jordan Lloyd has made the following excellent remarks: "There can be no doubt that some individuals contract—and even develop—venereal disease much more readily than do others. There can be no doubt that all physicians, from the nature of their calling, must,

[1] Eklund claims to have found in the secretions of both gonorrhœa and chancroid the characteristics "gonococcus" claimed to have been discovered by Neisser. He also describes mycelial woven filaments, termed ediophyton dictyodes. This parasite he also claims to have seen in both diseases. So far as it goes, this is confirmatory of the corelation of gonorrhœa and chancroid. I do not except Bumm's experiments as conclusive.

during the course of each year, be exposed to infection of one kind and another many hundreds of times. I am not aware that physicians take any particular precautions in the way of protecting themselves from these influences. Immunity does not, in every case, depend upon their having already suffered from attacks of the various infectious diseases. How is it, then, that they so rarely become affected? It is because they have not the predisposition, whatever that word may mean; because their bodies do not present a suitable nidus for the growth and development of the germs of disease. Again, in a class of cases more closely allied, clinically and pathologically, to those under discussion, how often do we see among hospital officers men who are frequently developing crops of hospital furuncles on their hands and arms, others with constantly recurring sore throat, others with inflamed wounds and lymphatics from *post-mortem* abrasions, while at the same time and under precisely the same conditions there will be men who, year after year, remain free from all such troubles. Susceptibility of one class of individuals to certain poisonous influences, or insusceptibility of the other, must be the explanation. There is nothing more strange in it than in that of many of the well-known "idiosyncrasies;" for example, the poisonous effects of eggs and tobacco on certain persons."

This author further alludes to a certain class of persons who are familiar to every observant physician, as "suppuraters." This is the class of people in whom, as we well know, wounds are more likely to heal by granulation than by first intention. Lloyd speaks of such persons as follows: "These people, apparently of robust health and iron constitutions, frequently have boils; when their lymphatic glands inflame; and they often do, the process more often terminates in suppuration than resolution; trivial wounds in such people do not dry up at once, they heal by granulation. I believe these suppurators contract venereal diseases where ordinary mortals escape them."[1]

[1] Birmingham Medical Review, October, 1886.

Under the head of local conditions, phimosis, paraphimosis, balanitis, posthitis, and herpes not only modify the course of chancroid, but indubitably act as predisposing causes.

As a consequence of the wide spread variation that exists in the conditions which I have given you, there may result from different inoculations of essentially the same products of decomposition different degrees of infection. Thus the disease acquired by exposure to such irritating material may be: 1st, a simple balanitis or balano-posthitis, or venereal vegetations; 2d, simple urethritis; 3d, a virulent urethritis; 4th, simple venereal ulcer indistinguishable from advanced herpes; 5th, classical chancroid. As you may imagine, I would find it difficult to show you just what variation in the development of the poison determined a gonorrhœa upon the one hand and a chancroid upon the other, but you will be perfectly safe in assuming that comparatively trifling differences in the circumstances of the development of the poison as well as the differences in the local and constitutional condition and idiosyncrasies of patients, are amply sufficient to account for the difference in results. We will lay theoretical considerations aside for the moment and consider some of the clinical facts bearing out the theory of the development of chancroid and gonorrhœa *de novo*, and its corelation with other and simpler affections:

1st. It is found that the discharge from a virulent gonorrhœa, if confined by a tight prepuce, will cause quite severe inflammation and phimosis (*i. e.*, balano-posthitis). If not speedily relieved, excoriations and even ulcerations will result.

2d. The discharge from these lesions, as well as that of gonorrhœa, will oftentimes produce a pustule if auto-inoculated. It will generally produce some inflammation, and in experiments upon cachectic patients, I have known the tissues to break down in ulceration, which, I am free to say, appeared to me to be identical with some of the simpler cases of chancroid.

3d. The long-continued contact of these secretions with the mucous membrane often causes a crop of

venereal warts. These frequently result from simple irritating secretions, *e. g.*, in pregnant women, and are an occasional complication of chancroid.

4th. Chancroid of the urethra is always attended by urethritis of greater or less severity.

5th. Gonorrhœa and chancroid are often associated in the same patient, either appearing at the same time or at such an interval that one may quite plausibly be due to infection by the secretion of the other.

6th. Both diseases are contracted from the same class of females, and often from the same woman. The higher class of prostitutes comparatively seldom convey either disease.

7th. I have myself examined women from whom both diseases have been contracted by different men at different times, and found them unclean, but at the same time free from both acute and chronic vaginitis and chancroid.

8th. Any of the urethral or genital lesions may be followed by suppurative bubo, differing chiefly in degree from virulent bubo. I have succeded in auto-inoculating pus from a bubo secondary to severe balanitis.

9th. It is always difficult to say where simple genital ulcer terminates and chancroid begins. The test of auto-inoculation is hardly fair, as it simply tests the degree of virulency of the ulcer.

10th. The natural tendency of chancroid is to lose its "specificity" in a short time, and by a reversion of type to assume the benign characteristics of a simple ulcer.

I have been asked why all cases of gonorrhœa do not present ulcerations if the poison be the same as that of chancroid, and why urethral chancroids do not destroy the entire urethra. Now let me repeat that I believe the poisons are similar in origin and kind, but different in degree. To the first question I would answer, because the virus is not so highly developed as that which produces chancroid, and because, moreover, the urethra is a different structure from the glans penis, and is being frequently flushed out by the urine. For that matter, instead of pronoun-

cing a case chancroid of the urethra and complicating urethritis, why not term it a gonorrhœa with ulceration? Perhaps the former diagnosis is confounding the *propter* with the *post*. In answer to the second question, I will state that the reason for the non-extension of urethral chancroid is the same as for its non-extension when it occurs upon the external surface of the genitals. As the virus invades increasing areas of healthy tissue, it necessarily meets with a resistance proportionate to the inherent vitality of the cells of the healthy tissue, and as a consequence, unless the local conditions are extremely favorable to the development of noxious and irritating secretions, the activity of the virus becomes exhausted after a time. In addition to this fact, we have the circumstance that there is more or less inflammation attendant upon chancroid, and as a result we have an exudative barrier of greater or less extent thrown up about the lesion, which opposes its progress to a certain extent. If, however, the patient be uncleanly or unhealthy, or if he be possessed of an idiosyncrasy predisposing to phagedæna, there is little vitality in the normal cells to oppose the inroads of the chancroidal process, and so slight an exudative formation that rapid destruction of tissue is liable to occur. These latter points must be taken into consideration in our studies and treatment of chancroidal phagedæna and phagedenic bubo, as they will be of great assistance to us in actual practice.[1]

Opera House Block, Chicago, Ill

[1] In his recent Lettsomian lectures, Mr. Jonathan Hutchinson expresses the opinion that chancroid usually occurs in persons whose systems have been impressed by syphilis at some period more or less remote. In other words, it is a mild manifestation of syphilis in a person who has already been syphilized. This theory appears to be as untenable as it is striking.

Gonorrhœa in Women.*

Gonorrhœa in the female is perhaps more often met with in the field of labor of the gynecologist than in that of the venereal specialist. This would seem from *a priori* consideration a trifle paradoxical ; yet if the more advanced views be correct the co-relatives of gonorrhœa and gleet in the male are most often considered by the practitioner to be of a simple and non-veneral character in the female. A knowledge of these conditions in their various phases, and a just appreciation of their relation, as regards cause and effect, to venereal infection, is absolutely indispensable to the genito-urinary surgeon, hence a presentation of the subject from a practical standpoint requires no apology.

The special consideration of the effects of "gonorrhœal" virus upon the female sexual organs is of great value, the more especially as the poison, germ, virus, or whatever term may be applied to it, is primarily generated in women. It is a peculiar fact that gonorrhœal inflammation in the female rarely presents a condition physically analogous to that observed in the male. Vaginitis of venereal origin is exceptional in women, and urethritis, the only real analogue, is excessively rare and does not often occur even when virulent vaginitis exists. The rarity of virulent vaginitis even among that numerous class from whom the male acquires the disease, is only explicable by the circumstances : (1) Of the existence in the female of latent gonorrhœal processes of a greater or less degree of virulence. (2) Of the acclimation of the vaginal mucous membrane to the toxic products of organic decomposition gradually formed in the female generative apparatus. If the proposition be accepted that the urethra of the male may become acclimated to the morbid conditions existing in the female, as often seen in the husband

* From the Author's Monograph on Gonorrhoea, Physician's Leisure Library. 1892.

of a woman who is poisonous to any strange male with whom she may copulate, it must also be accepted that the vagina of the female becomes inured to the contact of the irritating products of morbid conditions of the mucous membrane higher up—in other words, becomes tolerant of auto-genetic poisons. This same tolerance explains her resistance to the disease when brought to her by contagion. (3) Of the relatively inherent toughness of the vagina, as a consequence it may serve as a vessel in which toxic materials may be elaborated without becoming itself infected by them. This inherent resistancy does not extend to the endometrium, Fallopian tubes, and peritoneum ; hence a woman may have more or less active gonorrhœal processes in these parts, while the vagina is apparently perfectly healthy.

The importance of a knowledge of the direct and remote results of gonorrhœa in women, can hardly be overestimated, and is but recently receiving its due meed of attention. Foreshadowed by the labors and once ridiculed theories of Noeggerath, the researches of modern operative gynecologists are developing most astonishing facts relative to the subject in question.*

It must be remembered in this connection that there are two ways in which the gonorrhœal virus may act in the production of morbid conditions in women, and this fact, unfortunately, seems to have been overlooked by Dr. Noeggerath and his disciples. These investigators seem to believe that those morbid results of gonorrhœa which are manifested by diseased conditions of the uterus, Fallopian tubes, parametrium and ovaries, are the results of a primary imfection derived from uncleanly intercourse. This is a one-sided view of the question, for, as a consequence of various exciting causes, the pelvic organs of the female may become infected from various inflammatory and putrefactive processes in her own generative apparatus not necessarily dependent upon antece-

*The best article that has yet appeared upon gonorrhœal infection in women is, in my opinion, that recently published by William Jap Sinclair, of England.

dent contagion. While willing to accept in the main the doctrines of Noeggerath and his votaries, I am strenuously opposed to the idea that infection from without is the *fons origo et mali* in anything like the majority of cases. Professor Noeggerath's theory implies :

1. That nearly all individuals who have at a more or less remote period contracted gonorrhœa and have apparently been cured, are capable of imparting infection to the female. Thus men who have at some time had the disease, according to Nœggerath, infect their wives in the majority of instances.

2. That this infectiousness on the part of the male, is in many instances latent, but may possibly become perceptible by the occurrence of urethritis of a greater or less degree of severity, as a consequence of sexual intercourse.

3. That as a consequence of this latent condition of gonorrhœa in the male, there occurs a similarly latent infection of the wives of those thus affected.

4. That the majority of women who marry men who have at one time or another had gonorrhœa, become sooner or later the subjects of uterine and pelvic inflammations.

There is something very striking in these views, especially if we take into consideration the large proportion of women—particularly in large cities —who have pelvic troubles of various kinds. It is certainly peculiar that matrimony should entail upon the female so many varied, severe and annoying difficulties of the sexual organs. Faulty hygiene, improper habits and modes of living with an attendant hereditary transmission of physical defects, in consideration with sexual excess, explain these troubles to a certain extent ; add to these factors that of deliberate and vicious interference with nature's processes in the performance of abortions, and we have a series of all sufficient causes for gynic disease. It must be remembered, however, that the disproportion in the frequency of occurrence of gynic disease in city-bred and in country women, is greater than could be reasonably explained by these various factors. Add the elements

of prostitution and illicit intercourse, the opportunities for which are greater in cities, with their attendant facilities for the generation and transmission of infection, and the explanatory chain is complete.

Strange as it may appear, the more carefully we study pelvic diseases in women the narrower their etiological field becomes and the more frequently they are found to be dependent upon gonorrhœa. Thus, when freed from pathological and anatomical errors, pelvic inflammations are found to be dependent in the majority of cases, if not all, upon tubal disease, and tubal disease is unquestionably almost always due to gonorrhœal infection.

With regard to the frequency of gonorrhœa among the inhabitants of cities, Nœggerath said some years ago, "I do not know what the state of matters in other cities is; I did not know how we stood in New York, until I questioned the husband of every woman who came under treatment, but I believe we may apply here the dictum of Ricord that 800 men in 1000 have had gonorrhœa." He goes further and says, "I believe that I do not exaggerate when I say that gonorrhœa in 90 per cent of the cases, remains uncured. Of every hundred women who have married men formerly affected by gonorrhœa, hardly ten remain well, the others are afflicted by some of the ailments which I have attempted to describe."*

Making due allowance for exaggerations on the part of converts to the doctrines of Noeggerath, it must still be admitted that the poison of gonorrhœa may produce any or all of a series of disastrous results in the female pelvic organs. Thus there may be metritis, endometritis, salpingitis, hydro and pyosalpinx, ovaritis, parametritis, pelvic peritonitis, menstrual disorders and sterility, according to the severity of the process and the character of the structures affected. Although rare, vesical, urethral and even renal disease of an inflammatory character may occur as in the male.

It is to be remembered that, as already suggested,

*Morbid Results of Latent Gonorrhœa in the Female, 1872

these results may occur as a consequence of infection of the affected structures without the contagium being necessarily hetero-genetic. The point of departure is certainly not the urethra of the male, but as far as clinical evidence and theoretical reasoning enable us to judge, must of necessity be the generative apparatus of the female. Admitting this to be true, it is an indubitable fact that any woman whose generative apparatus is capable of infecting any male with whom she may have intercourse, is also, under favorable conditions, capable of infecting any portion of her own generative tract which happens to be susceptible to the irritating effects of the autogenetis poison. Such infection may occur without any exciting cause, although in perhaps the majority of instances some special circumstance or other is necessary to the development of infectious inflammation, *e. g.*, we will suppose that a woman of uncleanly habits, easy virtue and debilitated constitution, suffers from a miscarriage, as a consequence of which her parturient canal is in a wounded condition, the same poison—which various circumstances of environment have caused to develop in her generative apparatus—that would develop urethritis in the male may obviously produce in her such inflammatory conditions as severe metritis, endometritis, salpingitis, cellulitis, pelvic peritonitis, etc., etc. It is admitted that the male may contract urethritis from women who have, as far as can be determined, no specific inflammatory condition of the generative tract, but who are uncleanly and are afflicted with ordinary catarrhal conditions of the mucous membrane, which catarrhal conditions generate an acrid discharge. Is it not reasonable to suppose that when the sexual organs of such a woman become wounded in the process of parturition, she becomes susceptible to the local effects of this same auto-genetic poison? I venture to assert that, leaving out of consideration those cases of pelvic inflammation due to septic infection at the hands of the accoucheur, the majority of cases of pelvic disease following labor, premature or normal, are due to auto-infection. There may be

absolutely no lines of differentiation to be drawn between those cases in which the irritant poison is developed *de novo* in the woman and those in which it has been imparted to her through uncleanly intercourse. The results are the same.

While it is unquestionably true that many cases of urethritis in the male remain infectious for some time after gonorrhœa is apparently cured, I am still of the opinion that cases in which the disease has apparently been cured for six months or more are, in the absence of stricture, non-contagious; and there are instances in which a slight stickiness of the meatus still exists in which there are no properties of contagiousness, and it is perfectly safe to advise the patient to get married. That extreme caution is necessary in this respect, I am willing to admit, and that a patient with strictures should not be allowed to marry should, in my opinion, go without the saying. I have no disposition in any sense to antagonize the views of the Noeggerath school, but I must, nevertheless, protest against the illiberality of ascribing the results of gonorrhœal infection to direct contagion in all cases, with a total disregard of the numerous morbid possibilities of auto-infection.

Gonorrhœal vaginitis is usually seen in comparatively cleanly and healthy women who have become infected with the products of virulent urethritis in the male. The younger and more cleanly the patient, the more virulent the vaginitis. It is a striking fact that vaginitis in young children is apt to be very severe. I have seen but two instances of virulent vaginitis from contagion occurring in young female children—one in a child of ten years and the other in a child of four—both of which I was able to trace to their source. Rarely indeed, is so high a grade of inflammation seen in the adult female.

In connection with the possible infectiousness of chronic urethral disease in the male, I will again call your attention to the possibility of the transformation of the virulent process in such a manner that, although no longer capable of exciting virulent inflammation, there is formed at the site of the urethral disease

toxic compounds or ptomaines which are capable of exciting in the female gynic disease of various kinds. The possibility of gonorrhœal processes in the female becoming latent is of very great importance with reference to the transmission of the disease to the male. For example, supposing that a woman has been at one time or another affected with gonorrhœa, which has become localized in the Fallopian tubes; it is probable that under sexual excitement or during menstruation, a small quantity of the retained poison may be extruded into the uterus and mingling with the secretions of that organ and the vagina, eventually come in contact with the urethra of the male, exciting therein virulent urethritis. Her own mucous membranes are no longer susceptible to the irritant action of the virus because of their susceptibility having been exhausted by the primary infection. Upon examination such a woman would present no trace of virulent disease, although she would invariably be found to have been more or less pronounced uterine difficulty. A parallel case might occur in which the primary source of the disease was not from infection without. Supposing for example, as a consequence of sexual excess, filth, simple uterine inflammation, intemperance, cachexia and so on, a woman should develop the irritating poison of gonorrhœa; her own mucous membranes becoming gradually involved, the process finally disappears in other situations but localizes itself in the Fallopian tube and endometrium; as a consequence of some of the exciting causes heretofore mentioned, the pent-up poison is discharged into the vagina and causes urethritis with the first unlucky male who has intercourse with her. Upon examination she too presents no evidences of disease other than ordinary endometritis, and perhaps even this in a mild degree. To go a little further in describing the morbid possibilities of this latent gonorrhœal process of the Fallopian tubes, we will suppose that as a consequence of sexual excitement, traumatism, parturition, violent exercise, etc., a small quantity of this poison is discharged into the peritoneal cavity; obviously there would occur as a consequence, localized

peritonitis with possible pelvic abscess. It is a striking fact that these latent gonorrhœal processes probably on account of some transformation of the virus do not usually produce general peritonitis. This disease may, however, occur as a consequence of gonorrhœa, but almost invariably as a direct result of rupture of a pelvic abscess which is in itself due to gonorrhœal infection, or of an extension of virulent vaginitis, endometritis and salpingitis.

It is probable that gonorrhœal inflammation of a chronic character may affect the glandulæ Nabothi and Bartholini; under such circumstances the woman might go on transmitting contagion of urethritis for an indefinite period of time after all visible evidences of virulent vaginitis has disappeared, this being another of those puzzling cases in which urethritis is contracted from an apparently healthy woman.

The urethra of the female is very rarely involved in virulent inflammation, this being due to its protected situation. The vulva, or, at least, the more external portions of it, not being particularly susceptible to the products of virulent inflammation, the process does not readily extend itself to the meatus; it never does so, excepting in cases of virulent vaginitis due to contagion. Whenever in the course of a vaginitis, urethritis develops with or without inflammation of the bladder it is *prima facie* evidence that the disease was primarily due to infection. This fact is due not to any peculiar property of the virus, but to the fact that the urethra is never involved, excepting in the more violent cases of inflammation, and these more violent cases of inflammation are invariably due in the female to venereal contagion.

It has been claimed by Martineau that the reaction of the secretion of vaginitis determines the diagnosis of its specific or non-specific character. He claims that the pus of specific vaginitis is always acid, while in the simple variety it is alkaline. It is to be hoped that this fallacious test may not be depended upon for the differential diagnosis, inasmuch as up to the present time no other observer has been able to confirm the opinion of Martineau.

HYPERTROPHY AND HYPERPLASIA CONSEQUENT UPON LESIONS OF THE GENITALIA.

—Read before the Chicago Academy of Medicine—

In presenting the subject of hypertrophy and hyperplasia incidental to lesions of the genitals, I shall not attempt to edify you with a wearisome resumé of all this work that has been done in this field. Some of the work has been composed of such illogical reasoning and so many inaccurate observations, illy assorted and crudely digested facts, that it constitutes a mass of pathological and clinical inaccuracies, useful, perhaps, for comparison and criticism, but absolutely useless to a body of clinicians of this day and generation. As far as the historical interest surrounding the pathological errors of the past is concerned, the classical contribution of R. W. Taylor has done the subject full justice. It has been mainly through the efforts of this author that the fanciful and absurd pathological conceptions of Huguier, published only a little more than four decades ago, have been dispelled and the errors of those who have followed Huguier—like sheep following the bell-wether over the fence,—illumined by the light of modern pathology. It was an unfortunate thing for pathology, that the essay of Huguier on esthiomène or lupus of the vulva[1] was ever published, for it was so generally accepted as law and gospel as to have been regarded as a classic until comparatively recent years.

Great men fell into the pathological trap set for them by Huguier and his contemporaries quite as

1P. C. Huguier, Memoire sur l'esthiomene ou dartre rongeante de la region vulvo-anale. Paris 1849.

readily as did the rank and file of the profession. The fact that the late Isaac E. Taylor adopted and taught the views of Huguier is very significant in this connection.[2]

R. W. Taylor has well stated the case when he says, regarding Huguier's brochure: "It is very probable that most of his cases were those of old syphilis, their etiology was wholly unexplored and the clinical history of the fanciful disease was given in the most positive manner, though based only upon crude and far-reaching assumptions. It seems wonderful that his lucubrations were entertained by educated men. Yet even to-day, though there are a few dissenters, there are very many believers in a morbid entity which they call lupus or the esthiomène of Huguier. I do not know in all medical history of an essay founded on gross error and pure assumption which had such influence for so many years in moulding medical opinion, not only in France, but in other countries."[3]

The fact that the subject is still replete with error, or even a terra incognita to the majority of general practioners, is my excuse for bringing it to the attention of the Academy this evening. I do not hesitate to say, that in my opinion many specialists fail to grasp the principles of pathogenesis underlying the conditions which I propose to consider. In presenting these principles, I may be here and there somewhat heretical, but I trust that my facts may be none the less consistent.

Nearly, if not all the special work that has been done in the study of hyperplasia, chronic ulceration and hypertrophy of the genitals has been devoted

2Lupus or esthiomene of the vulvo-anal region. Trans. Am. Gyn. Soc. 1882.

3R. W. Taylor. Chronic infiltration, inflammation and ulceration of the external genitals of woman. N. Y. Medical Journal, January 4th, 1890.

to the study of these lesions in the female. It is my purpose to demonstrate that the lines of pathological parallelism between the male and female are closer than is generally supposed, as far as the lesions under consideration are concerned. The difference in degree and frequency is admited, but even this is due to certain local anatomical and physiological peculiarities, the result of which is by no means conducive to the well-being of the female.

Beginning with lesions observed in women, it is safe to say that Taylor's conclusions, as based upon hundreds of carefully studied and well observed cases, are not only comprehensive but with few, if any, qualifications absolutely correct. I therefore take the liberty of presenting them verbatim.

"1. A large and perhaps the greater number of chronic deforming vulvar lesions are due to simple hyperplasia of the tissues induced by irritating causes, inflammation and traumatisms.

"2. Chronic chancroid is a cause in a certain proportion of cases.

"3. Many cases are due to essential and specific syphilitic infiltration.

"4. Other cases are caused by the hard œdema which often complicates and surrounds the initial sclerosis and perhaps gummatous infiltration.

"5. Many cases are due to simple hyperplasia in old syphilitic subjects who suffer from the chronic ulcerations of the vulva long after all specific lesions have departed.

"6. Some cases, also in old syphilitics, are due to simple hyperplasia without the existence of any concomitant ulcerative or infiltrative process and *seem to be caused by conditions which usually in healthy persons only result in vulvar inflammation.*

Regarding the influence of simple irritation in the

production of deforming vulvar lesions, Taylor quite naturally takes up for consideration, vegetations, caruncles, and simple hyperplastic tumors of the vulva, and has traced the successive gradations of pathological development from these minor growths to those enormous tumors occasionally seen, which are productive of so much deformity and mechanical discomfort. In the light of our clinical knowledge of the smaller growths which indicate the point of departure on the road to extreme degrees of hypertrophy and hyperplasia, it is not easy to understand how local conditions alone as believed by Taylor can cause the development of such neoplasms. When we are confronted by the more formidable varieties of lesion, the query becomes still more pertinent: Are local circumstances of environment alone responsible for this condition? Is there not required some inherent predisposition? If not, why do not all patients with similar or worse local environment, present similar lesions?

How like the vegetable fungi is the development and even the physical appearance of the so-called venereal vegetations. Heat, miosture, filth, deprivation of light and air, and more or le ss continuous irritation are the essential conditions for the development of the mush-room-like genital vegetations. But whence comes the peculiar influence which develops them in one dirty patient rather than in any one of a dozen others? Why is it that a woman may develop from a comparatively slightly irritating discharge during pregnancy–mayhap without venereal infection—an enormous mass of vegetations, while much less cleanly and perhaps gonorrhœally infected women with profuse and acrid discharges escape? Why will vegetations springing up in several women, under circumstances apparently identical, take such

a dissimilar course; in the one, a few small and insignificant growths appearing, while in the other an enormous mass develops in an incredibly short time? It certainly must be admitted that the discharges of a pregnant woman have no specific property per se, yet it is during pregnancy, especially, that vulvar vegetations flourish and wax luxuriant. This, in face of the fact that women with serious uterine and vaginal discharges do not often become pregnant. If, then, there are no evidences of post-pregnant venereal infection we must necessarily admit that the presence of "venereal" vegetations in any given case is not a criterion of the acridity or specificity of the discharge.

Heat, moisture and darkness favor the devolpment of vegetable fungi, but these conditions do not develop fungi. The seed must be sown or pre-exist in the soil, and the soil itself must be of proper quality. We must either admit a special bacterium in genital vegetations, or else advance something in the way of individual susceptibility of tissue and tendancy to connective tissue proliferation, to explain the occurrence of these lesions in so small a proportion of cases of like conditions. Again, primary predisposition alone may not be a sufficient explanation. We must still explain the development of vegetations, caruncles, etc., in pregnant women, in whom the local conditions are no worse than for months or even years before pregnancy occurred, yet in whom vegetations develop only after pregnancy, and almost immediately thereafter.

It is easy to understand how one may be led to believe that local causes are all important in the causation of chronic deformities of the vulvo-vaginal and vulvo-anal region from observation of broken down prostitutes, but even these conditions occasionally occur in comparatively young women,

and persist and prove fatal despite removal of sources of irritation and best of treatment.

In seeking the cause of perverted tissue-growth, we must consider not only the excitant, be it bacterial, chemical or traumatic, that sets the process of pathologial tissue-building in motion, but the inherent physiological power of development—through the medium of which all perversions of tissue growth must necessarily act. Independently of the potential power of proliferation and development possessed by the cell per se, there exists, to put it metaphorically, a master architect and general superintendant of construction somewhere in the nervous centers, exactly where we do not know, but in close relation at least to the great sympathetic system. The result of this superintendency we recognize as the trophic or nutritive function of the nervous system. To consider whether there be a special trophic system or simply a specialization of function on the part of the sympathetic ganglia as a whole, which seems most probable, would be begging the question. As in the building of a house faulty construction may be in the direction of poor materials, lazy or incompetent workmen, or poor architecture or superintendency, so in tissue building we may have faulty pabulum, excessive zeal, or laziness and incompetency of cells, and faulty architecture or superintendency.

Now, it is my humble opinion that we are drifting away from certain sound principles of medical philosophy, abstract, perhaps, but still practical and logical, into too materialistic a view of pathological-states, the focal point of which is the germ and its products; or, to put it more succinctly, a view which is chiefly founded on the local and tangible influences which tend to excite pathological conditions. The

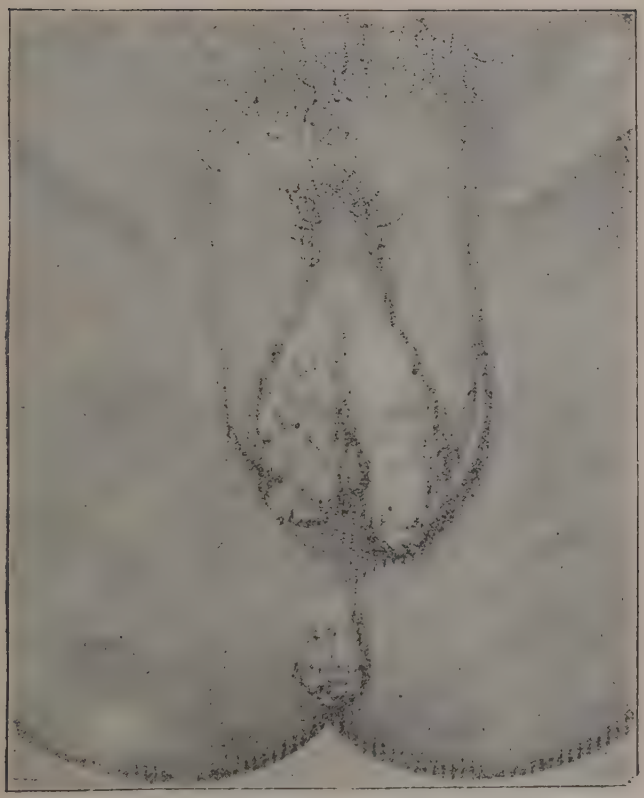

FIG. 1. Showing great hyperplasia of the clitoris and nymphæ. (After Taylor.)

influence of the nervous system, firstly in normal, and secondly in abnormal conditions of tissue-building, is forgotten.

As regards the various forms of genital hyperplasia and chronic induration, the microscope shows them to be composed of simple overgrowth of connective tissue with a varying amount of new vascu-

lar tissue. It is hardly necessary to call attention to the fact that we have here an excellent illustration of exaggerated repair, and that behind it we have the normal trophic impulse. Now, I cannot be convinced that this overgrowth is due to local causes alone; there is too great a disparity between the number of those in whom the supposed local causes exist and those in whom these conditions actually develop. I believe, in brief, that the difference between those who do and those who do not develop these conditions under like circumstances lies in the direction of the nervous system. In other words, I believe that the essential cause is a tropho-neurosis. We have not far to look for analogies. Have we as yet received any satisfactory explanation of Keloid? And where can we find a prettier illustration of tropho-neurotic disturbances than in herpes zoster and its congeners, more particularly herpes progenitalis? If the illustration of herpes progenitalis be not accepted, I desire to call attention to menstrual herpes and the herpes of pregnancy. These latter conditions may be associated in your minds with the menstrual and utero-vaginal discharges; I have, however, observed menstrual herpes occurring regularly just before and during menstruation, and in pregnant women who have no discharges of any kind. I have met with two cases where the first and pathognomonic sign of pregnancy is herpes progenitalis, recurring in one case precisely at the usual menstrual epoch.* The serious nutritive results of herpes, or rather the nutritive perversion of which herpes is but a symptom, are well known. Those who are engaged in ophthalmic practice will at once recall the disastrous effects of herpes frontalis seu orbicularis when the eye is invaded. As a further

*I have expatiated more fully upon the subject of herpes progenitalis in a paper read before the North Texas State Med. Assoc., Dec. 15, 1890.

illustration of a tropho-neurosis, I will call attention to Raynaud's disease. The cause of the tropho-neurosis may consist of a congenitally unstable equilibrium of trophic innervation, or of an acquired perversion due to constitutional causes or to local influences of a reflex character. There may or may not be a germ factor in the case. Obviously, when once the perverted tissue-building has begun, we may have at any time in the course of the affection intercurrent ulceration, suppuration or necrosis, dependent on the degree of tropho-neurotic disturbance, and the degree and kind of local irritation or infection present. It will be observed that I give due credit to purely local conditions.

In classes 2, 4 and 5 in Taylor's conclusions we have lesions which are, in my opinion, still more closely associated with tropho-neurotic disturbances than are the simpler genital lesions, and differing from the latter in the fact that there is a tendency to tissue necrosis which results in more or less extensive ulceration, and oftentimes sloughing. As far as chancroid is concerned, there is, even in the primary chancroidal infection, no tendency per se to extensive destruction of tissue; the process is self-limited. It is probable that phagedæna, sloughing, and serpiginous ulceration of a chronic character are not due to the primary infection, but to local or constitutional conditions predisposing to tissue destruction or to secondary infections. After eliminating all local causes of severity or malignancy, there still remains a certain proportion in which profound destruction of tissue results. In some of these a true cachexia exists as explanatory of the severity of the process, syphilis being very apt to lead to a severe type of chancroid. In others, however, healthy, robust patients will be attacked by phage-

dæna and perhaps serpiginous ulceration, while other patients of apparently less robust physique will contract simple chancroid from the same source of infection. This I have known to occur even among cleanly patients in private practice. The key-note to the situation I believe to be a tropho-neurosis in the one class, which does not exist in the other. If this be true of acute chancroid, how much more powerful must the element of tropho-neurosis be in the socalled chronic chancroid, a condition which should not be termed chancroid at all, and which consists of chronic post-chancroidal ulceration, the starting point of which is a virulent infection to be sure, but the perpetuation of which depends upon socalled idiosyncrasy. Would not the term tropho-neurosis, theoretical though it may appear, be a welcome substitute for idiosyncrasy in these cases? In the battle between the cells of the infected area and the poison of the infection, the cells conquer after a short period; the power of the virus is exhausted and simple ulceration takes the place of a virulent process; in other words, the product of the evolution under the modifying influence of the cells of the affected part. This, under normal circumstances and in the majority of individuals. Have we nothing better than the term "idiosyncrasy" to account for the cells giving up the fight in some less fortunate patients?

The relation of syphilis to hypertrophic and ulcerative chronic lesions of the female genitalia is, in my opinion, of the utmost importance. Dr. Hyde has dwelt with especial emphasis on the intimate association of syphilis with these lesions.* Dr. Taylor takes exception to the etiological prominence accorded syphilis by Dr. Hyde, but it seems certain

*Journ. Cutaneous and Venereal Dis.

that the conclusions of the latter are sound as far as his own cases are concerned. Taylor's word of caution is, however, timely, as it is quite common for the practitioner to attribute every lesion of the genitalia, whether simple or severe, to syphilis, if a history of that disease be elicited, no matter how remote the infection may have been. Leaving out of consideration the essential and specific syphilomata, there are certain cases, and these are by no means a minority, in which the relation of the syphilis is indirect, *i. e.*, we have processes resulting from simple irritation, traumatism or chancroidal infection, upon a syphilitic foundation on the one hand or a tropho-neurotic foundation produced by syphilis on the other. As an additional factor, alcoholism is apt to be quite prominent. It has been my fortune to see a number of cases of chronic ulcerative vulvar lesions, and it has so happened that, as far as I can recall the cases, they have all been patients who had passed through a more or less severe course of syphilis. As most of the cases I have seen have been hospital patients, and most of the old timers seen in hospital practice are syphilitic, this may not count for much, but it is worthy of note.

Another point which is worthy of consideration is that these cases are usually dosed with mercury at varying intervals and in varying amounts. I have seen many cases of chronic ulcerative processes not only about the genitalia, but elsewhere, that have been made worse by, if indeed their chronicity was not dependent upon, the abuse of this drug, which brings up the practical point that in these cases of chronic ulceration and hyperplasia of the female genitals, we must be careful not to treat the syphilis too vigorously, even if a clear history of that disease

exists; on the contrarv, we must treat the patient and her ulcerative process rather than a constitutinal infection which as an entity may no longer exist.

I have been led to regard the severe ulcerative and hyperplastic affections of the genitalia coming on at a late period in syphilitic patients in the same light as other sequelar lesions. Their true character I believe to be tropho-neurotic. I presented this view of the late lesions of syphilis in extenso in a paper before the Southern Surgical and Gynæcological Association, in 1889, a copy of which I recently sent to each member of this Academy. Time will not permit me to expatiate upon this subject this evening.

The source of tropho-neurosis in syphilis is rather complex and can be arranged in several factors. First, The effect of the syphilitic infection on the nervous system during the active period. This gives rise to tropho-neurotic disturbances both immediate and remote. Second, the effect of mercury, either from special intolerance or excessive and injudicious administration. Third, Alcoholism. Fourth, Vicious environment, with all that it implies. Fifth, Malnutrition from privation. Underlying all, may be a special fault of nervous structure with resultant instability of nutritive equilibrium under all forms of pathogenesis.

Does not this view of the etiology of the class of genital lesions under consideration explain the lesions described in Taylor's sixth class, of old syphilitics, in which simple hyperplasia "*seems to be produced by conditions which usually in healthy persons only result inflammation?*" If so, we have only to consider that the supervention of ulceration and infiltration depends upon the degree of the tropho-neurotic disturbance, and we can apply the same explanation to several

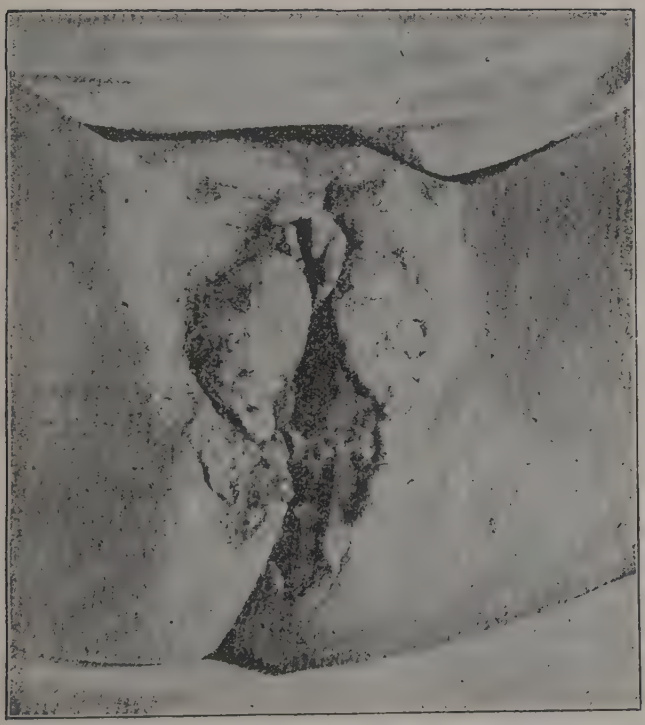

FIG. 2. Showing great destruction of hypertrophied vulva and perinæum in an old syphilitic. (After Taylor.)

of the other classes of these peculiar lesions. Aside from the tropho-neurotic element in the causal influence of syphilis upon the development of chronic deforming vulvar lesions, there is a special effect which may result from the primary lesion which may be developed at either an early or later period. This special effect is included by Taylor under the head of "cases caused by the hard œdema which often complicates and surrounds the initial selerosis

and perhaps gummatous infiltration." This indurating œdema is an important element not only in syphilitic cases, but may be a factor even in non-syphilitic lesions in subjects who have previously suffered from syphilis. Taylor lays especial stress upon its occurrence in the primary stage of syphilis, and states that it is the sole appanage of syphilis. This I believe to be true. As Taylor further shows, and as I have several times observed, cases occur in which a chancroid, or simple inflammation, may set up this peculiar condition months after the primary lesion has disappeared. Thus, I have seen one case in which indurating œdema followed a chancroid nearly a year after syphilitic infection. I am inclined to believe that some of the so-called chronic chancroids owe their chronicity to the fact that the infection has occurred upon a syphilized base. The explanation is not difficult. The immediate damage to the multitudinous capillary lymphatic supply of these parts by the primary lesion is well recognized. That this damage may be permanent is not to be denied. With looseness of structure, obstructed lymphatic drainage, dependent position and more or less constant irritation, traumatic and chemical, it is by no means surprising that œdema should finally merge into connective tissue hyperplasia and firm induration. That slight causes produce œdema of the genitals, primarily, is known by every one whose experience ranges over even a dozen or so of cases of venereal lesions in male or female.

It would be a work of supererogation for me to attempt a minute description of the peculiar indurating œdema of syphilis. Taylor's monograph is a classic on this subject. The point which I desire to make in connection with this form of lesion is that while later on the element of tropho-neurosis may

be superimposed, or may even exist primarily, the chief factor in the condition is of a mechanical character and relates to the lymphatic vessels and glands. Taylor dwells in this connection, on the active influence of the syphilitic diathesis in cases of late indurating œdema excited by traumatism, and shows the enormous hypertrophy of the vulvar tissues incidental to this peculiar œdema. The term diathesis is in this connection a little obscure. We should have some explanation of a local character, of the peculiar results of trauma and local irritation in a syphilized as compared with a non-syphilized patient. Is not the keynote of the pathological situation sounded by Taylor in the remark that "syphilitic inguinal adenopathy is obesrved as a rule in these cases?" The greater degree of lymphatic involvement in these cases as compared with ordinary syphilitics in the later periods of the disease, is to me an all sufficient explanation of indurating œdema. With depots clogged and roads obstructed it is not remarkable that pathological goods should accumulate in the factory, i. e., the genital lesion and its immediate environment. The possible irritating effects of pathogenic organisms must of course be considered in connection with the determination of the disease, and especiallv with its perpetuation if ulceration exists.

The analogy between the male and female types of chronic deforming and ulcerative chronic lesions of the genitalia is especially marked in cases of indurating œdema. That this may be extensive is shown by a case reported by Sturgis, a reproduction of which I will later exhibit. * I have seen a number of less marked cases of a similar character, and while I have seen a few in which indurating

* Journal Cutan and Ven. Dis.

œdema followed a concealed chancroid in which there was no history of syphilis and no subsequent symptoms of the desease, it has been my fortune to obcerve that in nearly all cases there has been antecedent syphilitic infection, or the œdema has been directly dependent on a chancre or a mixed sore. I am inclined to believe that while chronic ulceration is less often seen in the male, the comparative infrequency is due to local anatomical and physiological peculiarities, and the relatively greater facility of management of such conditions in the male. Many cases of condylomata, gummy ulcer and recurrent induration in the male might be transformed into chronic deforming lesions similar to those seen in the female, if local environment were favorable.

That the lines of pathological parallelism are sometimes quite closely drawn was shown by two very interesting cases observed during my term of service at the New York Charity Hospital. One of these was a young woman with so called lupoid of the vulva in whom the ulcerative hyperplastic process involved the entire vulva, the glands of the groin, and femoral regions in one continuous hyperplastic sluggish mass bathed in scanty ichorous pus. The condition was painless but the cachexia profound. This case proved resistant to treatment and finally died after many months invalidism.

The other case was that of a man under middle age who had a precisely similar condition, involving the entire penis, anterior portion of the scrotum and the inguinal and femoral glands. This case was in the hospital for four years and was treated in every conceivable way without effect. He finally drifted into a homeopathic hospital and died, after having achieved a tremendous reputation as a patholigical curiosity and a perpetual clinic. This man was a

robust person originally, who had been syphilized. The local infection which finally destroyed life was, in all probability, in no wise different in these two cases from that in thousands of other cases of chancroid, but observe the difference in results. Surely there must be some special condition behind such cases. This I have already expatiated upon.

The possibility of these cases having been tuberculous may suggest itself at this point. Although I saw these cases before the question of the tubercle bacillus had assumed very definite proportions, and consequently cannot speak authoritively, I do not believe they were tubercular in character. Neither case developed tubercle elsewhere and both cases were of long duration. It is probable that some few cases of so-called esthiomène have been of a tuberculous nature. There is a form of local ulcer occasionally seen which begins as rounded, dark-red or purplish tubercles, finally forming ulcers with a fungous, granulating surface, free purulent secretion, and hard everted borders. Taylor has seen three cases of this kind, and following Hardy and Bazin, classifies them as "*scrofulide tuberculeuse ulcéreuse.*" These cases, however, he observed before the advent of the bacillus tuberculosis. In one case pulmonary phthisis existed. Taylor concludes from his observations, "That vulvar ulcers, not hyperplasiæ or hypertrophies, may be very rarely caused by tuberculous infection and that they should be included in our classification. If it is hereafter established beyond all question that lupus and tuberculosis are wholly identical in their nature and clinical history, we shall then have to admit that there is a lupus of the external female genitals. In the meantime we can content ourselves with the thought that

what has heretofore been considered as lupus on these parts is not lupus at all." There is a peculiar form of chronic vulvar lesion described in former times as oozing tumor, and cases of which were reported by Duncan, as lupus and hemorrhagic lupus, which are of interest. Taylor attributes the so-called hemorrhagic condition to the excoriation of coapted hypertrophic surfaces, and the consequent exudation of serum or sero-sauguinolent fluid. I observed one case in the New York Charity Hospital which was quite typically hemorrhagic. The woman had been syphilized, and contracted achancroid which became chronic. Pregnacy occurred and soon afterward the labia became enormously swollen and painful. Hemorrhage from the affected part soon began and the pain was relieved, but the parts settled down in a state of obstinate chronicity. The hemorrhage persisted constantly. Notwithstanding the fact that confinement occurred in the venereal ward, which was filled with the worst class of cases, and despite the local condition which so favored septicæmia, the woman not only convalesced satisfactorily, but her local lesion entirely healed in a few weeks. The relation of the pregnacy to the hemorrhagic condition of the lesion is obvious. The child of this woman, by the way, subsequently died of meningeal hemorrhage of distinctively syphilitic origin.

ABERRANT SEXUAL DIFFERENTIATION.

The subjects of imperfect or aberrant sexual differentiation are much more numerous than is generally supposed, but fortunately the majority of cases are either slightly marked or of little practical importance as regards their physiological and social relations.

Time was when certain marked cases of physical deformity were of vital importance to medical jurists, and hermaphroditism, so-called, received considerable attention on the part of authorities upon jurisprudence. Thus in England, where the law of primogeniture exists and the male is therefore relatively so important a factor in the body social, the traditions of law upon hermaphroditism still prevail to a certain extent.

As our knowledge of physiology and morphology has advanced, however, the so-called hermaphrodite has not only decreased in numbers, but is no longer of such vital importance. The principal feature of such cases now-a-days is the question of impotence on the one hand, and sterility on the other.

Hermaphroditism in its literal sense implies a mingling of the physical and functional characters of both sexes, the crucial test being at the present day the existence of a more or less perfectly formed testicle and ovary in the same individual. In this sense there is, as far as I am aware, not a single case of hermaphroditism on record. I am aware that such are described,

but I do not admit their authenticity. It is admitted, however, that cases are occasionally seen which require great diagnostic acumen for their differentiation. An illustration of this occurred in Paris several years ago. A case coming under the observation successively of Guyon and Fournier, was in a lengthy opinion positively asserted to be male by one, and quite as positively pronounced a female by the other of these eminent gentlemen.

Many cases occur in which a diagnosis is impossible until the age of puberty, when certain sexual proclivities—menstruation, the development of beard, changing voice, etc., as the case may be—decide the question of sex. It is a fact that in marked cases of so-called hermaphroditism, the afflicted person not only has not a mixture of male and female organs, but is practically a neuter, being incapable of exercising the functions of either sex. When, however, the subject of general malformation is also a sexual pervert, appearances may indicate an apparent commingling of the functional capacity of both sexes. A case which came under my own observation aptly illustrates this: A "hermaphrodite" mulatto cook in my neighborhood not only had intercourse with women, but was in the habit of enticing young lads into attempting connection. An endemic of gonorrhœa among the lads of the locality led me to investigate the source of the disease and I readily traced it to the negro hypospadiac.

Aberrant sexual differentiation is not always physical but may be functional, *i. e.*, dependent upon imperfect differentiation of sexual affinity. As sexual affinity is but a form of "hunger" (Clevenger, *op. cit.*)* or chemical affinity, sexual perversion might naturally be expected to result. It may be seen therefore that pæderasts, urnings (Caspar, *op. cit.*) and other sexual perverts are really akin to epispadiacs and hypospadiacs.

The subjects of imperfect sexual differentiation may be classified as follows:

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* "Physiology and Pathology," S. V. Clevenger.

1. Imperfect differentiation of sexual affinity without defective structure.	Pæderasts, Urnings, Subjects of bestiality. Affinity of the female for her own sex.
2. Defective (*i. e.*, imperfect differentiation of) structure.	*a.* Simple (*i. e.*, with normal sexual appetite). *b.* Complex (*i.e.*, with perverted sexual appetite)

Under this head comes some cases of hypospadias and epispadias, and certain cases of rudimentary condition or absence of uterus, ovary, testicle and penis.

In an old work upon jurisprudence (Guy, *op. cit.*) cases of sexual peculiarity (*i. e.*, physical malformation) are classified as follows:

1. Male individuals with such unusual formations of the generative organs as in many respects to resemble the female.

2. Female individuals with such unusual formation of the same organs as to resemble the male.

3. Where a mixture of the sexual organs of both sexes is exhibited without either being entire.

It is obvious that there are certain acquired conditions which would fall under the above classification which would not be true cases of aberrant sexual differentiation; *e. g.*, a prolapsed and hypertrophied uterus has been mistaken for a rudimentary penis, and females thus afflicted have been known to copulate with other females. An hypertrophied clitoris may be mistaken for a rudimentary penis.

The importance of caution in deciding the sex in cases of genital malformation is aptly illustrated by a comparatively recent case occurring in this city. In this case society was electrified by the discovery that a supposed young lady who had been visiting about and sleeping with *bona fide* young lady friends, was a boy. The first intimation of the truth was the development of a pronounced beard with a bass vocal accompaniment.

There was considerable anxiety for a time lest the supposed girl had discovered his meritorious qualities prior to their detection by others. He naively con-

fessed that "it always did make him feel funny to sleep with the girls."

The assertion that certain cases of sexual perversion are akin to epispadias and hypospadias and the result of imperfect differentiation, may seem a trifle far fetched, but I hold to the opinion that, even when the differentiation of sex is complete from a gross physical standpoint, it is still possible that the receptive and generative centers of sexual sensibility may fail to become perfectly differentiated. The result under such circumstances might be, on the one hand, sexual apathy, and upon the other, an approximation to the male or female type as the case may be. Such a failure of development and imperfect differentiation of structure would necessarily be too occult for detection from a physical standpoint by any means of investigation at our command. It is, however, only too well recognized by its results and is often responsible for disgusting cases of sexual perversion which we are prone to attribute to moral depravity. I have elsewhere elaborated this point, and upon the relation of reversion of type to sexual perversion. (*Philadelphia Medical and Surgical Reporter*, September 7th, 1889.) Thus a failure of development is equally responsible for certain cases of sexual perversion and instances of hypospadias and epispadias.

Cases of gross physical aberration of genital structure are not difficult to account for, as far as the modus operandi of their formation is concerned, but their cause is not so readily explicable. How far maternal impressions enter into the causation of genital deformity is a question upon which it is to be hoped much light may some day be shed. There is evidently an exhaustion of formative energy before complete fusion of the two lateral segments, of which the embryo is practically composed.

Defective genital formation bears the same relation to this exhaustion of formative energy, as do crania bifida, spina bifida, etc. It is obvious that the degree of deformity depends entirely upon the period at which developmental progression ceases. As far as appearances go, we would naturally conclude that dif-

ferentiation does not cease at a very early period in the life history of the fœtus, else true hermaphroditism would not only occur in reality, but would be frequent.

Geoffroy St. Hiliare, one of the older writers, mapped out a very elaborate plan in explanation of hermaphroditism in a work especially devoted to that subject. He divided the generative apparatus into a series of portions or segments, three in each lateral division. The upper set comprised the testes and ovaries, the middle the womb, prostate and vesiculæ seminalis, the lower the penis and scrotum, clitoris and vulva. According to him, therefore, there might occur any number of varieties of hermaphroditism, according to the combination of defective structures. This scheme was defective because of the fact that, in spite of all appearances to the contrary, differentiation never falls short of determining one or the other sex.

The simplest plan for the explanation of genital deformities and anomalies is to remember that the fœtus practically develops in two halves, and that any failure of union at the genital furrow will result in a greater or less degree of aberration of genital formation.

The relation of aberrations of genital formation to sterility and impotence is very important. Impotence does not exist in the female unless there be atresia or complete absence of the vagina. Almost any aberration of the structure of the ovary or uterus will, however, produce sterility. In the male impotency is more apt to result than sterility, as serious deformity may prevent erection, or sufficient development of the organ to prevent intromission. No matter how great the deformity, however, the individual may be fruitful if circumstances be favorable, as long as the testicles are functionally perfect.

In determining the sex of alleged hermaphrodites, the following points require consideration:

1. The character of the voice.
2. The development of the mammæ.
3. The growth or absence of beard.
4. The form of the shoulders, hips and waist.

5. The presence or otherwise of the menses or vicarious discharges.

6. The character of sexual desire. (In respect to this point, the occasional coexistence of sexual perversion with genital deformity should be given its due meed of consideration. Thus in a case in which difficulty of diagnosis existed a perverted sexual affinity for the same sex might mislead the physician.)

7. The presence or absence of rudimentary (or perfect?) testes and ovaries.

8. The form of the supposed clitoris or penis, the method of attachment of its prepuce and the absence or presence of perforation.

9. The presence or absence of the hymen (rudimentary), nymphæ, labia majora or bifid scrotum, as the case may be.

In cases of doubt it is safest to regard the individual as a female until time and pubescence have settled the question.

The cases of imperfect or aberrant sexual differentation included under the head of sexual perversion, are obviously more difficult to study than those in which the aberration is of a purely physical character. This is especially true regarding the sapphic love, or sexual affinity of female for female. That such cases are frequent I am convinced, but they are extremely difficult to trace; the confessional of the family physician doubtless might offer evidence of a clinical character, but the physician is very chary of airing the short-comings of his patients in this particular direction. The existence of this aberrant sexuality can only be explained by the theory of reversal of type.

In the case of the male, instances are so common that the subject is decidedly trite. It is not only charity, but a sense of justice and a desire to lessen the stigma upon human nature, that impels me to include cases of sexual perversion under the head of aberrant sexual differentiation, and to attribute the condition to perverted or imperfect evolutionary development on the one hand, and a reversal of type on the other.

A PLEA FOR EARLY OPERATIVE INTERFERENCE IN ACUTE PERITONITIS, WITH ESPECIAL REFERENCE TO THE SO-CALLED IDIOPATHIC PERITONITIS IN CHILDREN.

A perusal of the record of results of strictly medical treatment in acute peritonitis, since that disease was established as an entity by Bichat, in 1802, is not conducive to professional conceit. Before the introduction of the opium treatment by the late Dr. Alonzo Clark, in 1850, the disease was almost invariably fatal. Prior to Clark's innovation opium had been given in moderate doses by Stokes, Graves and others, for its anodyne effect. Clark, however, advocated putting the bowels, as he expressed it, in "opium splints" through the medium of full narcotic doses of the drug. According to this eminent authority the criterion for the administration of the drug is the production of the following symptoms: "Subsidence or marked diminution of the pain; some or considerable tendency to sleep; contraction of the pupils; reduction of the breathing to twelve respirations per minute. In the

favorable cases a considerable reduction in the frequency of the pulse; a gentle perspiration and itchy state of the skin, or oftener the nose. Absolute inactivity of the bowels, and after a time subsidence of tumescence and tenderness and some suffusion of the eyes."

This treatment was immediately adopted by the majority of progressive physicians as a routine measure, and has, strange to say, for forty years been the main reliance. Reaction against this routinism is but just now attaining prominence In no other field of medicine has there been a less pronounced spirit of progressiveness during all these years than in the treatment of peritonitis. The ready adoption of the opium method and the implicit reliance which was placed upon it, was probably due to the fact that previous methods of treatment had signally failed, and the new method had at least the merit of saving a certain proportion of cases, and under its use the sufferer from the disease was certainly comfortable. As compared with the success attainable in other acute inflammatory affections, the opium treatment of peritonitis has not proved a brilliant success.

In an excellent article upon peritonitis, Dr. Stiles Kennedy,[1] of St. Louis, Mich., concisely presents the true status of the opium treatment when he says: "Speaking for myself, with thirty years' active practice, I pronounce the treatment a miserable failure. All patients do not die under the opium treatment, but 75 per cent. of them do." With a much shorter period of observation, the brevity of which, however, has perhaps been compensated for in a measure by several years hospital experience, I can heartily endorse Dr. Kennedy's position. Great as was the advance in therapeutics instituted by Dr. Clark, it unfortunately came to be regarded as the *ultima thule* of therapeutics of abdominal inflammations. Who is there here but will bear me out in the assertion that any attempt to

[1] American Lancet, December, 1889.

classify and differentiate abdominal inflammations with regard to a discriminating selection of therapeutical methods, has usually been regarded as rank heresy,—I was going to say malpractice,—ever since the opium treatment came in vogue? Even those who have discriminated between traumatic and so-called idiopathic cases of peritonitis have failed until quite recently to discriminate in the matter of treatment. Septic cases, in which apparently the principal object to be attained is the draining away of putrid materials both from the abdominal cavity direct and *via* the intestinal canal, have been treated upon the same principles as cases which were apparently of non-septic origin.

There is a feeling at present among progressive physicians,—and to strengthen this is the principle object of this paper,—that peritonitis is, so to speak, more of a surgical disease in general than it has been regarded heretofore. Speaking for myself, with a keen realization of the hopelessness of the majority of cases when medically treated, and I believe, with a proper appreciation of the origin of the disease in the majority of cases, I feel warranted in the assertion that peritonitis should nearly always—I was going to say invariably—be relegated to the domain of surgery. To put it vulgarly, I might support this position by the assertion that the physician has had an inning of forty years' duration, which, to carry the base-ball phraseology a little further, has resulted in a "goose egg." It is but fair that the surgeon now be given a chance to compare methods at least; as far as experience has gone the results of surgery are certainly more encouraging than those attained by medical treatment. The more thoroughly the pathology of peritonitis is studied the more obvious the truth of this assertion becomes. Like most surgeons, I now see few cases of peritonitis which are not distinctly recognized as traumatic. As most cases are supposed to be idiopathic, the surgeon sees comparatively few such. I believe, however, that

a proper appreciation of the true pathological and etiological status of the disease on the part of the general practitioner will enable the surgeon to observe and treat such cases more frequently.

The etiology of peritonitis has attracted considerable attention. It has usually been divided into idiopathic (primary and secondary), and traumatic.

I have no hesitation in putting myself upon record as believing that there is no such thing as primary idiopathic peritonitis. The more carefully we inquire into the history of the disease the narrower the range of the so-called idiopathic cases becomes. To attribute the disease in the absence of any known organic cause, to exposure to cold, dietary indiscretions, etc., is, it seems to me, simply a substitute for an honest expression of ignorance. That the disease may be secondary to certain constitutional affections is probably correct. It has been attributed to rheumatism,[2] erysipelas,[3] and the various eruptive fevers, especially scarlatina,[4] equinia or glanders,[5] septicæmia, and purulent infection.[6] Its dependence upon puerperal septicæmia, uterine and pelvic inflammations is well known. Anstie describes epidemic infectious peritonitis as being due to sewer gas. Certain chronic constitutional diseases, such as gout, Bright's disease, and tuberculosis are well known causes. Renal disease, as a cause of abdominal inflammation, is mentioned by several excellent authorities.[7]

Traumatic peritonitis is not always easily traced to its cause. There are many cases of course which are readily so traced. A history of injury with palpable lesion, either in the form of penetrating wounds, or such conditions as contusion or rupture of the liver, spleen, stomach,

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[2] Vivant, 1884.
[3] Cheurlin, 1879.
[4] Moor. Dublin Journal Medical Sciences, 1876.
[5] Mahomet. Schmidt's Jahrbücher, 1884.
[6] Hilton Fagge. 1873.
[7] Woillez. Bull. de la Soc. Med. des Hôp., 1885. Hilton Fagge. Guy's Hospital Reports, 1873–1875.

intestines, kidneys, bladder, or womb is most usually elicited.

The relation of cause and effect is sufficiently plain in the case of operative interference with the abdominal cavity or its contents. Certain rough manipulations of the abdomen have been known to produce the disease. Compression of the left ovary in an hysterical woman has been known to produce it.[8] I mention this especially to show how slight a cause is sometimes sufficient.* The dependence of the disease upon minor gynecological operations, intestinal perforation from various causes, such as typhoid fever, typhlitis, perityphlitis, etc., is well recognized.

Although it is supposed that idiopathic peritonitis may occur at any age up to that of 55 years, it is a well recognized fact that "idiopathic cases" are relatively much more frequent in children, the frequency being in inverse proportion to the age.

Children are very often taken with the disease while apparently in a condition of perfect health. This, it seems to me, is in itself inconsistent with the idiopathic theory;—a fact which is significant is that adhesions and pus are an almost invariable result of idiopathic peritonitis. One of the best arguments in favor of surgical interference that I have seen is the naïve assertion of Gauderon that recovery sometimes follows the escape of pus through the umbilicus. This mode of termination was noticed by him in eleven cases out of twenty-five, and of these eleven cases there were eight recoveries. It would be interesting to note how many of the remaining fourteen cases recovered, as showing in how far the chances of recovery were directly dependent upon the exit of the pus; *i. e.*, in how far nature's surgery was a hint to the surgeon.

It has occurred to me that the reason for the greater apparent frequency of idiopathic peritoni-

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[8] Comby. De Bull. de la Soc. Anat., 1880.

* There was possibly, in this instance, tubal disease, the contents of the tube being discharged or its walls ruptured by the manipulation.

tis in children is due to their inability to describe the particular accident to which the inflammation should properly be attributed. Children receive so many bumps and falls that even when well advanced in years they are not likely to attribute any special importance to any particular accident. The peritoneum being more sensitive in children their greater susceptibility to peritonitis from slight injuries is at once obvious.

Leaving secondary peritonitis out of the question, I do not believe in the existence of the idiopathic variety of the disease in young children. It is very easy to injure the peritoneum, especially in young subjects in whom the strength and thickness of the abdominal walls are by no means proportionate to the responsibility of protecting the viscera. Abdominal fat in young children, for example, is not very abundant. The sensitiveness of the abdominal contents in children to various causes of irritation is a well recognized explanation of the excessive mortality rate of childhood. Not only are the viscera relatively more sensitive than in the adult, but the peritoneum is also a *locus minoris resistentiæ*. Injuries which are so slight as to be innocuous to the adult may produce peritonitis in young children. I believe that peritonitis in young children follows very often injuries so slight that the child never complains of them. I am firmly convinced that the so-called idiopathic peritonitis always follows a lesion of greater or less severity. Severe strainings at stool, blows upon the abdomen producing bruising of the intestines, parietal or visceral peritoneum or mesentery may produce it. Comparatively slight violence exerted upon the stomach when full,—and we all know how disproportionately prominent the distended stomach in young children is,—may give rise to peritonitis. Very slight injuries to other viscera and especially the liver, may give rise to the disease. The bruising may be so slight as to leave no trace which is visible post-mortem, and yet be sufficient to light up general peritonitis. A bruise over the distended

bladder, or if the bladder be not bruised, a wrench of its peritoneal attachments incidental to a fall, may give rise to the disease.

A point which I desire to again emphasize is the disproportionate size and weight of the abdominal contents in young children, as contrasted with the natural provisions for their protection. As a corollary of this point, I venture the assertion that falls and jars may in children produce concussion of the abdominal contents with resultant strain (with or without slight rupture), of those retentive ligaments which are either derived from or invested by the peritoneum. There is certainly in young children considerable disproportion between the strength of these retentive ligaments and the weight and dimensions of the organs which they are intended to support.

A cause of peritonitis in children, which I believe will in the years to come be more frequently recognized, is inflammatory affections in the region of the cæcum. I believe that typhlitis and perityphlitis, due to enteroliths or other foreign bodies in the vermiform appendix, constitute one of the most frequent causes of so-called idiopathic peritonitis in young children. The reason, it seems to me, that this is not more frequently recognized is the fact that in children the disease runs a very rapid course, has a more pronounced tendency to general extension, and kills the little patient before those tardy evidences of localized inflammation and suppuration are recognized by the physician. How frequently we overlook cases of perityphlitis in the adult, treating them perhaps for typhoid fever or some other disease for days or perhaps weeks before we are enabled to make a positive diagnosis. It is all very well for the surgeon who is called in at the eleventh hour, to criticise the physician for failing to discover the pathognomonic induration in the ileo-cæcal region at an earlier day, but there is a question in my mind whether the surgeon himself in many instances could have done any better. With a full realization of the possibilities of error in the differenti-

ation of typhoid and perityphlitis, I will confess that I have myself remained in doubt for days at a time, in cases in which I afterwards operated. If, then, we make such mistakes in the case of the adult, how much more likely are we to overlook until too late, localized inflammation in the child.

The disease begins abruptly, extends quickly, and within a very few hours perhaps we may have an enormously distended abdomen and all of those physical conditions which absolutely preclude that careful and thorough examination which might insure an accurate diagnosis. Often, in my opinion, the little patient will die of acute general peritonitis which has originated in perityphlitic inflammation long before an adult would perish under the same conditions. The formation of lymph, plastic material, and protective adhesions does not occur in the child because of the rapid extension of the inflammation. The child dies unoperated on, and the case is recorded as another sad illustration of the fatality of idiopathic peritonitis in children. Authorities are united in the opinion that pus is rapidly and almost invariably formed in the peritoneal cavity in children. As already stated, a number of cases of recovery have occurred in which the pus escaped spontaneously. Under such circumstances the chances of life of the patient are entirely dependent upon the caprice of nature. If the pus escapes early enough or burrows in a favorable direction the patient may recover. If nature is unkind, death results.

In a general description of perityphlitis, Drs. E. W. Lee and J. B. Murphy, well known and competent surgeons of Chicago, concisely state the situation as follows: "Are we doing our duty to our patients by allowing them to take such chances? Why should pus in this locality be allowed unaided to find its favorable or unfavorable exit, in contradistinction to the well established rule to properly aid its escape in all other parts or the body where accessible? Who has not seen a similar case to this? The patient is taken suddenly ill, complains of pain in the abdomen; has

vomiting, a rapid, feeble pulse, and a pinched, anxious expression of countenance. Examination reveals the abdomen to be uniformly distended and sensitive—in short, with all the symptoms of acute peritonitis, usually terminating fatally on the third or fourth day. *Were we permitted to make autopsies on all of the cases presenting the above history we would find that a large percentage of them were produced by the rupture of a perityphlitic abscess into the peritoneal cavity.*"

I will apply these remarks especially to cases of peritonitis in children, and I believe that I am warranted in asserting that in a large proportion of cases of fatal so-called idiopathic peritonitis in children, we would find, were we permitted to make an autopsy, that the disease had originated in perityphlitic inflammation. Rarely perhaps would we find the inflammation to be secondary to an abscess which had ruptured. To present my ideas more concisely, I believe that many cases of peritonitis in children are due to perityphlitic inflammations which are similar to those occurring in the adult, with the exception that in the child they are followed immediately by acute general peritonitis, while in the adult intermediary changes about the cæcum occur. In cases of traumatic origin, the site of the injury might escape observation because of the rapidity with which ecchymosis had disappeared.

Regarding the dependence of peritonitis in children upon slight traumatism, I have in my own limited experience met with a number of cases which were supposed to be idiopathic, but in which careful inquiry elicited a history of slight traumatism. I recall a case at the present moment of a child in the neighborhood, who was not under my care, who died of what a number of competent physicians termed idiopathic peritonitis. My wife, who was interested in the little one, was discussing the case with me one evening, and upon my expressing my belief that the child must have been injured in some way, exclaimed: "Now I remember, the little

girl was playing with some of the other children in front of our house a day or so before she was taken sick, and I saw one of the other children push her down. She fell with her stomach across a curb-stone. She got up, cried for a few moments, and then went about her play as if nothing had happened."

The second case, which came under my observation in consultation, was pronounced idiopathic by two competent physicians; but careful inquiry among the playmates of the boy revealed the fact that he had injured himself by jumping from the roof of a shed two days before he came ill. As his mother had forbidden his climbing upon the shed, he had concealed the fact of the injury. This concealment on the part of young children through dread of parental sternness is in my estimation a frequent cause of obscurity in the etiology of peritonitis.

Still a third case. I was called by Dr. G. W. Reynolds, of Chicago, to see a case of peritonitis from some unknown cause, and found a child of 5 years of age already *in extremis*. On inquiry I found that the child had recently been presented with a velocipede from which he had fallen several times. He had hurt himself slightly, but not severely enough to attract attention on the part of his parents.

In this case, as in the preceding, I attributed the peritonitis to concussion of the abdominal contents. I have notes of several other cases of a like character, but will not burden the Section with their recital.

The treatment of acute peritonitis is undergoing a pronounced change. Indeed, the transition from narcotic routinism bids fair to bring the profession to the opposite extreme. The free administration of laxatives, especially those of a saline character, is now being advocated in some quarters quite strenuously. This is going to the opposite extreme with a vengeance. Once again, there seems to be a tendency on the part of the profession toward indiscrimination in the proper selection of cases.

Lawson Tait and Greig Smith openly advocate saline cathartics in the treatment of peritonitis of a surgical character. Bantock, however, opposes this. It is not my intention however to discuss the merits and demerits of medical treatment, as my paper is already spinning out to an unwarrantable length.

The surgical treatment of peritonitis is to my mind the most important consideration in connection with this disease. The trite aphorism that "history repeats itself" is well illustrated in the case of peritonitis. Erasistratus and Soranus ages ago several times cut into the peritoneal cavity in the inguinal region to evacuate pus accumulated in the abdomen. From this time, however, until 1735 a period of surgical horror of the abdominal cavity existed, surgeons being afraid to touch the peritoneum.

In 1735 Petit (*fils*) advocated operation for peritonitis. In 1737 he operated upon cases of traumatic peritonitis, with favorable results. He was followed in 1748 by Garengeot. Chomel advised operation to permit the escape of effusion after the subsidence of acute symptoms. In 1846 Guerin advised copious irrigation of the peritoneal cavity with warm water in generalized puerperal peritonitis, suggesting the removal of effused fluid by aspiration and the injection of warm water until the liquid returned clear. He advised an operation at the supervention of meteorism. In 1861 Marten[9] advised the opening of the abdomen with the knife, especially in peritonitis due to pathological perforations. In 1865 Keith[10] operated upon an ovarian cyst in a patient suffering from acute peritonitis; recovery followed. In 1876 Kaiser[11] reported several cases of simple purulent and puerperal peritonitis in which operation proved successful. Puerperal peritonitis has several times been surgically treated with good results. Traumatic peritonitis has frequently

9 "Surgical Treatment of Peritonitis," Virchow's Archives, 20, p. 530.
10 Lancet, 1865, vol. xi, p. 36.
11 Deutsche Arch. f. Klin. Med., 1876, 17, p. 74.

been treated by surgical interference since the modern works of Vincent-Bouilly, 1883, and Chavasse, 1885. Prior to 1887 Lawson Tait had already operated upon nearly fifty cases of peritonitis of all kinds. Since that date he has operated upon many others. He says distinctly: "Whenever I find myself in the presence of localized or generalized peritonitis, whatever may be the cause, I open the abdomen and treat the peritoneum according to the indications furnished by actual inspection. Peritonitis is, in abdominal affections, a most powerful indication for surgical interference."

It has been shown that a comparatively slight exploratory incision will often suffice to bring about a favorable result.

In concluding the general history of the surgical treatment of peritonitis, I feel safe in asserting that it is a modern procedure which is rapidly gaining favor all over the world.

I will now discuss briefly what appear to me to be the principal arguments in favor of early operative interference in peritonitis, especially in the grave forms of so-called idiopathic peritonitis in children and in traumatic peritonitis under all circumstances, but more especially where the inflammation is generalized, or has resulted in the local accumulation of pus. An important point in considering the surgical treatment of peritonitis is the analogy of the peritoneal membrane to the pleura, and other serous membranes to synovial structures. Inflammations of these tissues are, as is well known, extremely painful and disproportionately depressant. Much of the pain and depression is incidental to distension of the sensitive membrane by the accumulated products of inflammation. How frequently a slight surgical procedure will secure relief from the most intense agony in such conditions! Puncture of the anterior chamber of the eye in serous iritis; puncture of the tunica vaginalis in cases of epididymitis; incision of the tunica albuginea in orchitis; aspiration of the thoracic cavity in effusive

pleurisy, are all familiar illustrations of this surgical principle. Relief of tension is the only measure which in such cases will produce rest. The more intimately associated the affected membrane with the sympathetic nervous system and with the organs of vegetative life, the more severe the agony and the more pronounced the resulting depression. Applying these principles, as we all do, to inflammation of other structures, why should we not apply them to peritonitis? What membrane of the body is more delicate, more sensitive, more important in its physiological functions, more intimately associated with vital organs, more intimately associated with the lymphatic system, and, most important of all, so intimately associated with the sympathetic ganglia, than is the peritoneum? Taking these things into consideration, is there any wonder that inflammation of so fragile a structure produces such a disproportionate degree of vital depression?

Careful clinical observation has shown us that *pari passu* with the development of meteorism and distension of the abdomen by fluid products of inflammation, we have a pronounced increase in the depression of the powers of life. Not only does inflammation of the peritoneum *per se* produce reflex inhibition of the cardiac ganglia, but incidentally to meteorism and effusion there occurs a direct mechanical interference with the action of the heart. Does it not seem, gentlemen, that the first indication in a case of peritonitis is the relief of pressure and incidentally the removal of gas, fluid and foreign bodies?

So profound is the influence of abdominal distension upon cardiac action that we are apt to be misled in our judgment as to the wisdom of an operation. Many cases that seem too far gone to warrant an operation may recover if the depressing effects of tension upon the peritoneum and abdominal organs and the mechanical interference incidental of meteorism are removed by operation. So simple an operation as aspiration of the

intestines will often produce an almost immediate relief from pain and a decided and unmistakable improvement in the character of the pulse.

I would like to ask the members of this Section whether there is, in their estimation, any possible objection to operation in cases of peritonitis. The indications for the operation are plain; contraindications are *nil.* Should we hesitate to interfere with the peritoneum, which can under any circumstances be interfered with, providing we can prevent inflammation and sepsis? Should we hesitate, I say, when inflammation is already present and the conditions for sepsis already exist, and when, moreover, the only possible way to avoid sepsis is to remove the products of inflammation, or such foreign materials as may be responsible for the condition present? I do not believe that judicious operation will in any case lessen the prospect of recovery. I believe, further, that delay in most cases impairs the chances of the patient.

In operating, especially in children, it is best to be conservative. It is possible to evacuate purulent and gaseous matters without superadding to the shock of the peritonitis that of an extensive operation. A small exploratory incision, with a flushing out of the peritoneal cavity and a thorough washing of the matted coils of intestine with warm water, either plain, slightly saline, or impregnated with boracic acid, will, in my estimation, relieve tension, favor asepsis, and save life in many cases. While the operation should be done early where practicable, it is my belief that there are few cases in which the operation is not indicated, providing the patient is not already *in articulo mortis.*

Since becoming converted to this view my experience has been limited to a single case, which I will briefly recount.

Case 1.—This was the case of a girl, 7 years of age, who fell against a table, injuring the abdomen slightly. She made very little complaint, and it was not supposed that the injury was of

any importance. On the fourth day peritonitis developed and ran a very rapid course. The child, however, was strong and vigorous, and although considerably prostrated the case seemed an exceptionally favorable one for surgical interference. On the third day I proposed operation, which was consented to. I opened the abdomen in the median line by a small exploratory incision 2½ inches in length, punctured the intestine with an exploring needle at all accessible points, and flushed out the abdominal cavity with warm water containing a small amount of boracic acid. I inserted a small drainage tube and stitched the incision about it and dressed the wound antiseptically. The operation of flushing was repeated on three successive days, after which time the drainage tube was removed and the wound allowed to heal, which it did perfectly. Relief from the operation was immediate, and the suffering of the patient was at no time thereafter severe. After the operation a full half ounce of Epsom salts was administered, which resulted in very profuse catharsis. I could see no possible objection to this procedure, and I think that the recovery of the patient was partly attributable to it. It certainly appears to me logical to apply, where possible, the principle of depletion to inflammations of the peritoneum. This is best secured by salines. I do not wish to be understood however as advocating the saline treatment as a routine measure.

In conclusion I will formulate my views of acute peritonitis as follows:

1. I do not believe in the existence of acute idiopathic primary peritonitis.

2. The majority of cases of so-called idiopathic peritonitis in children will be found, upon inquiry, to be traumatic.

3. Slight injuries of the abdominal contents are relatively more dangerous in children than in adults.

4. Acute peritonitis in children, while apparently idiopathic, is often secondary to perityph-

litic inflammation, which runs a rapid course and extends to the general peritoneum without the intervention of appreciable local changes.

5. The profound prostration and cardiac inhibition characteristic of peritonitis are in a great measure incidental (1) to tension of the peritoneum produced by inflammatory products, with a consequent reflex inhibition of the heart, and (2) mechanical interference with the heart's action.

6. Surgical interference is indicated in all severe cases of general peritonitis and in cases of localized suppurative inflammation, or in cases of perityphlitic origin, whether due to foreign bodies or not.

7. There is every indication present for operation, and no logical objection to it. The operation is almost invariably palliative, if not curative.

8. Operation in no sense impairs the chances of recovery. *Per contra*, it enhances them to a great degree.

9. No case should be allowed to die without operation, unless already *in articulo mortis*.

10. It is not necessary to make a large incision, excepting in cases in which perityphlitic abscess is known to exist, which is rarely the case in children. If perityphlitic abscess exist and is recognized before operation, the incision should be made at the most favorable point, which in the majority of cases is the typical line for ligation of the common iliac, as pointed out by Murphy and Lee. In by far the majority of cases in children a simple median exploratory incision, with flushing of the abdominal cavity, is sufficient.

NOTE.—The discussion following the reading of this paper suggested to me the possibility of my views being misinterpreted. I do not condemn the judicious use of opium, nor would I recommend operation in all cases of peritonitis. My paper bears directly upon fulminant attacks, and those which, although less acute, are resistant to ordinary measures of treatment.

A STUDY OF A SERIES OF DEGENERATE AND CRIMINAL CRANIA.

Presented before the Chicago Medical Society, April 20, 1891.

It is my fortune to be able to present to the Society a series of specimens illustrative of the aberrant types and asymmetry found in degenerate skulls, and especially those of criminals. These specimens are especially interesting from the fact that they have not been selected from among a large number, but have been picked up here and there by non-scientists, solely for their morbid and historic interest, having subsequently fallen into my hands quite by accident. It is worthy of comment that even the remarkable series depicted in Lombroso's

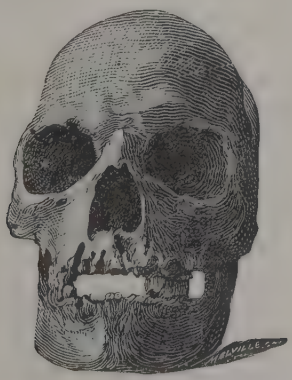


FIG. 1—Front View of Extreme Dolicho-cephalic Cranium.

Atlas does not present such markedly aberrant types as this comparatively small series of studies;

indeed, a search among several thousand skulls would not be apt to bring to light such peculiar types of conformation as the crania which we present. The illustrations are from photographs and are exceptionally accurate.

The specimen first to be described is one of the most interesting crania which I have had the privilege of studying. The subject was a negro criminal of the petty class, who spent most of his time in correctionary institutions. As might be inferred from the extremely degenerate type of cranial development which is here exhibited, he was of a very low grade of intelligence. After a very precarious existence this negro committed suicide.

In viewing this skull from the front, one is at once struck by the immensely powerful maxillary and malar development as contrasted with the remainder of the cranium. The orbits are relatively very capacious. The superior maxilla is relatively poorly developed, at least as compared with the lower jaw. Rarely indeed, is such an inferior frontal development found associated with such a pronounced facial development.

As will be seen in connection with the specimen of brachy-cephalic degeneracy shown in Figs. 21, 22, 23 the frontal development in this narrow type of skull may be vastly better than some specimens with a decided tendency to the brachy-cephalic type. The skull at present under consideration is the most marked specimen of the dolicho-cephalic cranium which I have seen. As the cephalic index in this case is 59.9, the extreme variation according to Isaac Taylor and others being from 58 to 98, the extreme type of this skull is at once obvious.

FIG. 2—Lateral View of Extreme Dolicho-cephalic Skull.

On viewing this skull laterally, its strong similarity to the anthropoids is very striking. This is especially marked with respect to the development of the mastoids and the occipital protuberance; the position of the latter is quite an anomalous one, and the occipital bone is almost horizontal. Despite its extraordinary development, the occipital bone is relatively small, both transversely and in its vertical measurement. The distance from the posterior border of the foramen magnum to the superior occipital angle is only 103 m.m.

On contrasting this with any of the other crania of the series, the relative shortness of the occiput is very noticeable. For example, Fig. 10, which is a rather small specimem, distinguished rather by the symmetry than the extent of its development, shows an occiput measuring 130 m.m. from the foramen magnum to the superior angle of the occipital bone.

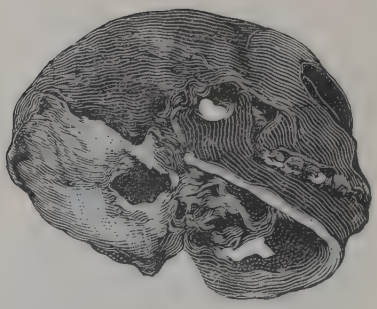


FIG. 3.

Fig. 3 shows the inferior surface of this dolichocephalic specimen, and brings out the massive development of the processes and muscular attachments at the base of the skull. It is evident that the muscles of the neck in this case were immensely powerful, a *sine qua non* where the leverage for muscular action is so short as in this particular occiput. The facial type in this specimen, is markedly prognathous as regards both upper and lower jaws.

The *tout ensemble* in this case is strongly suggestive of a reversion to the anthropoid type, which is often the distinguishing characteristic of the degenerate Ethiopian type, criminal or otherwise. The following are the measurements of this exceedingly interesting cranium:

Cephalic index.....59.9
Circumference.....48.4 c.
Anterior demi-circumference.....21.3 c.
Posterior demi-circumference.....26.9 c.
Bi-zygomatic diameter.....13.3 c.
Longitudinal diameter.....196.5 m.m.
Transverse diameter.....122 m.m.
Vertical diameter (vertex to foramen-

magnum) ..... 132 m.m.
Occipito mental ..... 241.5 m.m.
Bi-frontal diameter ..... 95 m.m.
Bi-mastoid diameter ..... 114 m.m.
Over vertex, from ear to ear ..... 317 m.m.
Ant. bord. foramen mag. to sup. occipital angle ..... 103 m.m.

The excessive development of the jaws and alveolar processes in this specimen, are such as are generally observed in the negro races, in whom the jaws are usually well developed and rarely deformed. The only noticeable feature of this particular specimen is a high palatal vault.

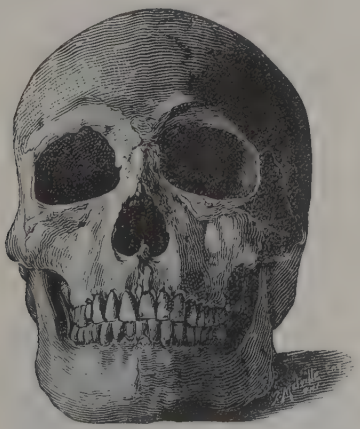


FIG. 4. Skull of a Mongolian suicide. Brachy-cephalic.

The next specimen is not especially noteworthy from the standpoint of degeneracy, being interesting chiefly on account of its peculiar history, and its exceedingly fine development. It is, however, an excellent illustration of the brachy-cephalic cranial type.

The subject was a Chinese cigar-maker of Chicago, who is remembered to have been thoroughly civilized and quite prosperous. Physically, he was a fine, well developed and handsome fellow. He became engaged to a white girl, whose Mongolian affinity weakened at the last moment, and this, preying upon his mind, impelled our Mongolian friend to shoot himself. This was noteworthy, as this subject was the first Chinaman in America to commit suicide, and there has been but one since, as far as I can learn. The peculiar religious belief of the Chinese, explains the rarity of suicides among those in America, suicides being frequeut in their native land.

The contrast between the negro skull, Fig. 1, and Fig. 4 is very striking, and obvious to the most careless observer. A front view of this specimen shows a splendid development of the jaws and teeth. I have never seen a finer and more regular set of teeth than this. Like the negro race, the Chinese is characterized by well-formed and strong jaws and teeth.

FIG. 5.—Skull of Mongolian suicide. Brachy-cephalic.

The characteristic excessive development of the facial and jaw bones among the Chinese is well shown by a lateral view of this skull. The disproportionate development of the face and jaws in this intance is, however, much above the average Mongolian skull. By comparing the two views the brachy-cephalic type of the cranium is readily observed. By comparing the views of this cranium with those of the negro shown in Figs. 1 and 2 one may observe the wide difference between the extreme types of high and low cranial indices. This is nowhere better shown than by a comparison of marked Ethiopian and Mongolian types.

On examination of the crania of the more degenerate types among the Chinese it will be found that the tendency is toward a high cranial index. The tendency of the degenerate types of a brachy-cephalic race to become more brachy-cephalic, and that of a dolicho-cephalic race to become more dolicho-cephalic is peculiar, but is borne out as far as my opportunities for study have permitted me to observe.

Aside from a change in the cranial index there are seen, among negroes particularly, many peculiar aberrations of form, one of which is shown in Fig. 16. The palatal arch in this Mongolian specimen is high, and the alveolar processes excessively developed. The measurements of this skull are:

Index	83.9
Circumference	50.6 c.
Anterior demi-circumference	29.4 c.
Posterior demi circumference	21.2 c.
Longitudinal diameter	174 m.m.
Transverse diameter	149 m.m.
Vertical diameter	145 m.m.
Bi-mastoid diameter	127 m.m.

Bi-frontal diameter ..... 96 m.m.
Foramen magnum to superior occipital angle ..... 139 m.

The next specimen presents some extraordinary features. It is the skull of a celebrated negro panel-worker, confidence operator and desperado, who, at the time of his death, was the consort of a notorious courtesan who flourished in Chicago some years ago.

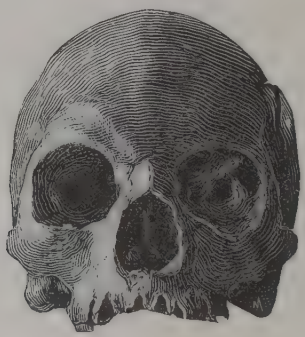


FIG. 6.—Negro Panel-worker. Dolicho-cephalic.

This individual, after some years dalliance with the law, without especial harm to himself, was finally knifed in a brawl. A front view of the cranium shows the ordinary and characteristic negro facial type, with the exception, perhaps, that the bones are exceptionally massive and well-developed. Unfortunately the inferior maxilla is absent, a fact which I greatly deplore, as the general cranial development suggests to me the probability that the missing part presented some very interesting features for consideration. A lateral view of this cranium shows the ordinary dolicho-cephalic negro type. The cranial index is low, being 72.1. A comparison with Fig.

1, however, shows the extreme degeneracy of type in the latter to great advantage.

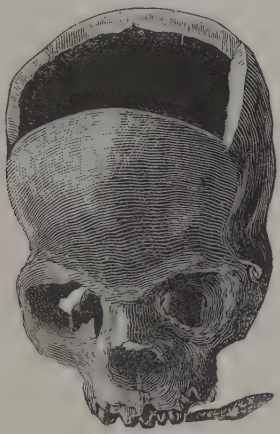


Fig. 7.—Negro panel-worker. Dolicho-cephalic.

A view of this skull (Fig. 7), after a section of the calvarium has been removed, shows its most interesting features. Skulls of such extreme thickness, even among negroes, are rarely met with. The consistency of the bone in this cranium is very dense and hard, and traditionally this negro, while alive, was noted for his butting propensities. Violent contact with such a skull would be apt to damage the fist of a Sulivan. Indeed, it is said that this fellow rather enjoyed the impact of a policeman's club.

I will state at this point that we are of the opinion that the massiveness of bony development in this case is not due to disease. The general character of the overgrowth, and the consistency of the bone, would seem to support this view. Syphilis may produce thickening of the cranial bones, as some

of Virchow's specimens show, but syphilitic bone does not present the characters and uniformity present in this case.

At the densest part of the calvarium this specimen measured 13 m.m. in thickness, its average thickness being 11 m.m. A comparison with Fig. 9 readily shows how phenomenal the osseous development in this case is. The cranial measurements are:

Cephalic index	71.1
Circumference	47.8 c.
Anterior demi-circumference	25.4 c.
Posterior demi-circumference	22.4 c.
Longitudinal diameter	181.5 m.m.
Transverse diameter	131 m.m.
Vertical diameter (vertex to foramen magnum)	128 m.m.
Bi-frontal diameter	95 m.m.
Bi-mastoid diameter	113 m.m.
Bi-zygomatic diameter	126 m.m.
Anterior border foramen magnum to sup. occip. angle	117 m.m.

The upper jaw and alveolar process in this skull is well developed, the only peculiarity being a low palatal vault.

FIG. 8.—Skull of prostitute. Dolicho-cephalic.

Fig. 8 shows the skull of a once notorious member of the Chicago *demi-monde*. She was a very tall woman, of mixed Indian and white blood. The cephalic index shows what might be inferred from the appearance of the cuts—a decided dolichocephalic type, and a peculiar outline. This specimen is the most symmetrically developed of the series, with the exception of the Sioux squaw next to be described, and whether coincidental or not, the fact remains that this subject presented a higher type of intellectuality while living than any of the other subjects embraced in this essay. The skull is nevertheless of a degenerate type, as shown by its extreme tenuity, and its markedly dolicho-cephalic index.

Fig. 9 shows the extreme thinness of the calvarium, which was at the point of section only 3 m.m. in thickness. A striking feature of this skull is its freedom from prominences, its surface being uniformly smooth and rounded. In this respect the specimen differs greatly from another cranium of a prostitute in the same series which I have examined, but of which unfortunately I have no illustrations. In this case there was an excessive development of the occipital bone, the enlargement being symetrical and most marked upon the left of the median line. The right parietal eminence was excessively and disproportionately developed. The cranial index was markedly dolicho-cephalic.

The principal measurements of the scull at present under consideration are:

Cephalic index.....67.09
Circumference.....51.2 c.
Anterior demi-circumference.....22.9 c.
Posterior demi-circumference.....27.3 c.
Longitudinal diameter.....190 m.m.

Transverse diameter.....130.5 m.m.
Vertical diameter.....128 m.m.
Bi-frontal diameter..... 88.5 m.m.
Bi-mastoid diameter..... 71 m.m.
Bi-zygomatic diameter .....130 m.m.
Anterior border foramen magnum to ant.
sup. occipital angle.....116 m.m.

The jaw in the case is poorly developed but fairly well formed. In regard to the extreme tenuity of

FIG. 9.—Skull of prostitute. Dolicho-cephalic. Calvarium partially removed.

the skull, I do not believe that it is the result of pathological change. The general lightness of the bones and the symmetry of the skull are not consistent with the existence of such bone changes as might produce absorption and thinning. The markedly dolicho-cephalic type of this skull is interesting in view of the strain of Indian blood in the subject. As has already been observed, the degenerate type in dolicho-cephalic crania is in the direction of a still lower index, and in this instance

the admixture of Indian blood evidently determined the degenerative type. This observation would appear to be contradicted by the case outlined in Figs. 12, 13, 15. In this case, however, there was an admixture of negro and Mexican blood, with a resultant degeneracy of form in general as well as in the cephalic index. This case, in fact, partakes in some respects of the character of a teratological rather than an atavistic type *per se*—at least as far as the facial development is concerned.

A comparison of the prostitute's skull with the female Indian type next presented shows a marked difference in the cranial index, the disparity being 7.07. Even the negro in Fig. 6 is less dolicho-cephalic than this specimen.

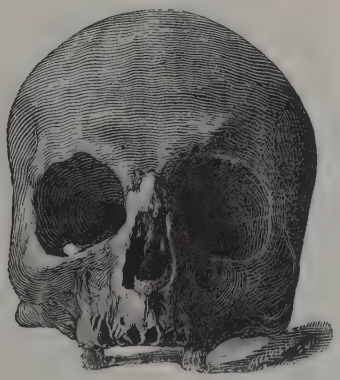


FIG. 10. Skull of Sioux Squaw. Dolicho-cephalic.

The next specimen is the cranium of a full-blood squaw of the Uncpapa Sioux, who was the wife of one of the leading malcontents in the recent Indian outbreak, and consequently of the better type of Indian development.

This specimen is exceptionally symetrical and

moderately dolicho-cephalic. Aside from points of contrast, there is little of interest to be said of it in connection with the present series. The subject was as intelligent as the better class of her people average, and there is nothing to be said regarding her from a standpoint. Indeed, as the saying goes, the shoe might be on the other foot, as the Indian estimate of the Caucasian grave-robber is not a high one, as evidenced by his treatment of the desecrator of the Indian burial-places when the latter happens to be caught. However, as my connection with the aforesaid desecration is very remote, I trust that my red brother will extend his forgiveness.

FIG. 11.—Skull of Sioux Squaw. Dolicho-cephalic.

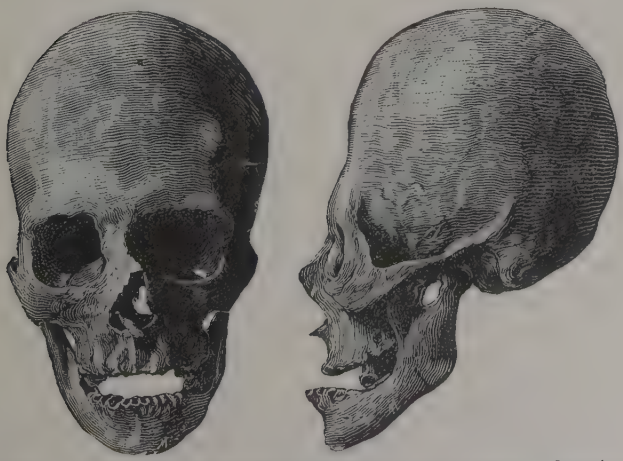
Fig. 11 shows the same skull in lateral view. Its symmetrical outline is quite evident. The measurements are as follows:

Cephalic index	74.16
Circumferential	51.2 c.
Anterior demi-circumference	26.6 c.
Posterior demi-circumference	23.8 c.
Longitudinal diameter	161 m.m.
Transverse diameter	152 m.m.
Vertical diameter	140 m.m.

Over vertex from ear to ear.....318 m.m.
Occipital protub. to root of nose.....293 m.m.
Bi-mastoid diameter.....121.5 m.m.
Bi-frontal diameter..... 96 m.m.
Anterior border foramen magnum to superior occipital angle.....130 m.m.

The superior maxilla presents arrested development. The vault is of medium height, and the alveolar processes well-developed. It will be found that in the Indian, as in all primitive races, a well formed palate and regular teeth are the rule. It would be interesting, at some future time, to study the effects of civilization of the Indian in this regard.

The next cranium which I will describe is the most remarkable of the series, and in many respects presents phenomenal characters. (Figs. 12 and 13.)



FIGS. 12 and 13.—Half-breed Mexican and Negro. Brachycephalic.

The subject was a half-breed Mexican and negro, who had left Mexico—his native country—for the good of his compatriots. While he had never distinguished himself by any startling act of criminality and had managed to keep himself out of the clutches of the law, he was identified with the petty criminal class which forms a prominent portion of all social systems, and with which Mexico is especially infested. He finally died in a public hospital, as a result of some acute disease with cerebral complications. The general physique of this man was very fair, although he presented a generally overgrown and loose-jointed appearance. When alive, he was a very peculiar looking specimen indeed, the dome-shaped appearance of his cranium being exaggerated by a luxuriant crop of kinky wool, several inches in length, that stood straight out from his head. From a mental standpoint, he was up to the average of the negro race, but morally speaking, he was decidedly degenerate. One of his prominent characteristics was a very irritable and irascible temper.

This cranium, as is well shown in the appended illustrations, is most markedly brachy-cephalic; indeed, its circumferential outline is almost perfectly round, its longitudinal and transverse diameters being nearly equal. The term dome-shaped is as nearly accurate as possible from a descriptive standpoint. It is a singular fact that the degenerate type of the African skull often presents the oxy-cephalic or rafter-headed type, even when the dolicho-cephalous index is pronounced. These rafter heads are often seen.

The skull at present under consideration is, as already remarked, a distinctive dome shape, which corresponds not at all with the rafter head.

The peculiar conformation in this case is evi-

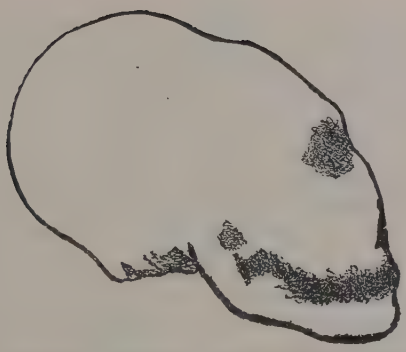


FIG. 14—Outline of Ancient Peruvian Skull Mechanically Deformed.

dently not the result of pathological conditions or mechanical pressure. The vault of the cranium is quite symmetrically developed, although the base of the skull is decidedly asymmetrical, as will shortly be shown. I know of no mechanical means which might have caused the peculiar dome-like form of this specimen, nor have I been able to find mechanically deformed crania of a similar type. Such deformities as those presented by the Chinook or Flat-head Indians are quite familiar types of skulls mechanically deformed. Certain specimens found in ancient Peruvian graves are almost precisely identical with the characteristic Chinook type, and show a probably common origin of the two races. This type is fairly well shown by the conventional outline of Fig. 14.

There are several interesting features in connection with the skull under consideration: One of the most striking is the extreme shallowness of the orbits. This is well shown by comparison with some of the other types already described, the measurements being one and three-quarter inches from the upper margin of the orbit to the optic for-

amen, while in the Indian and negro skulls in this series the orbits measure two inches in depth. The outer walls of the orbits encroach upon the cavities, giving a still more marked appearance of shallowness.

The inferior maxilla also presents some peculiarities: The coronoid processes are very small and short, the body long, and the angles very oblique. The anterior alveolar process is excessively developed. The same is true of the alveolar process of the superior maxilla, it being so situated on the outer surface of the jaw that the teeth were necessarily tipped in to facilitate occlusion with the lower teeth. The central incisors were evidently lost in early life, the alveolus being absorbed and the border of the jaw only one-eighth of an inch in thickness at this point. The palatal vault is very low, and the general development of the jaws imperfect.

There is a marked deflection of the vomer and ossæ nasi, evidently of non-traumatic origin, and due to excessive development of the osseous and cartilaginous structures of the septum nasi. The nasal spine is enormously developed. The cranial index in this case is extraordinarily high, being slightly above the maximum given by most anthropologists. The type is as marked in the direction of a brachy-cephalic index as is Fig. 1 in the direction of a low or dolicho-cephalous index.

Fig. 15 shows the inferior surface of the skull under consideration. A glance suffices to show its remarkable asymmetry. The foramen magnum is almost entirely to the left of the median line. A line drawn through the center of the foramen traverses the median line of this surface at an angle of about forty-five degress. The center of the an-

terior border of the foramen is situated at 76.5 m.m. from the left, and 58 m.m. from the right mastoid. The center of the posterior border of the foramen is 64 m.m. and 61 m.m. from the left and right mastoids respectively. The margin of the foramen is extremely thin, and the occipital ridges very prominent. Measurements of this skull are:

Cephalic index	98.1	
Circumference	46.5	c.
Anterior demi-circumference	22.6	c.
Posterior demi-circumference	23.9	c.
Longitudinal diameter	146	m.m.
Transverse diameter	143	m.m.
Vertical diameter	148.5	m.m.
Root of nose to occipital protuberance	313	m.m.
Anterior border foramen mag. to sup. occ. angle	91	m.m.
Bi-mastoid diameter	115	m.m.
Occipito-mental diameter	248.5	m.m.
Bi-frontal diameter	95	m.m.
Bi-zygomatic diameter	133.5	m.m.
Over vertex from ear to ear	350	m.m.

On comparing the longitudinal, vertical and transverse diameters of this remarkable skull with those of some of the others of the series, the relatively great height of this dome-like cranium is made very apparent. Thus the diameters are:

	Trans.		Long.		Vert.	
Fig. 1	122	m m.	196.5	m.m.	132	m.m.
Fig. 4	146	m.m.	174	m.m.	145	m.m.
Fig. 6	131	m.m.	181	m.m.	128	m.m.
Fig. 8	130.5	m.m.	190	m.m.	128	m.m.
Fig. 10	152	m.m.	161	m.m.	140	m.m.
Fig. 19	140.5	m.m.	180	m.m.	136.5	m.m.
Fig. 21	149	m.m.	168	m.m.	118	m.m.

Those of the specimen under consideration being

FIG. 15.—Inferior Surface of Half-breed Cranium.

Trans. 143 m.m., Long. 146 m.m. and Vertical 148.5 m.m., a comparison with Fig. 21 is especially interesting.

While making some observations at the Joliet penitentiary I discovered an example of the dome-shaped brachy-cephalic cranium which strongly resembles the extraordinary specimen just described.

This subject (Figs. 16 and 17) is a mulatto about twenty-three years of age, who is doing time for attempted murder. He is a surly, truculent fellow, of a low grade of intelligence, and inclined to be unruly. He is at present suffering from a mild type of syphilis. The form of the cranium is well worthy of remark, the more especially as it so nearly approximates the type shown in Figs. 12 and 13.

The facial bones, jaws and teeth in this case were extremely well developed, and the palatal vault normal. There was no history of mechanical compression, and as the subject was born in Tennessee such a cause is improbable, if not impossible. The measurements were not complete. As far as taken they were:

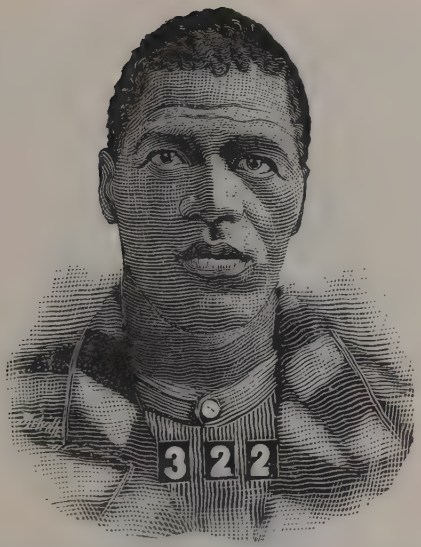


FIG. 16.—Dome-shaped cranium; mulatto. Brachy-cephalic.

Cephalic index	76.7	
Root of nose to occipital protuberance over vertex	39.5	c.
Transverse diameter	145	m.m.
Longitudinal diameter	191	m.m.
Circumferential	50.8	c.
Occipito-frontal diameter	59	m.m.
Occipito-mental diameter	28.5	m.m.

The dome-like form of this cranium will be more evident on comparison of the two principal measurements with those of a skull of average development. A comparison was made with that of one of the white orderlies in the prison hospital, a man of fine physique and good cranial development. It was found that while the measurement over the vertex was the same as that of the negro, 39.5c., the circumferential measurement was 58.5c.

The next specimen (Figs. 18, 19, 20) is the skull of a noted Western criminal and desperado, who was lynched for train-wrecking in Wyoming a number of years ago. The conduct of this man during the progress of the lynching stamped him as a bravo of the most hardened type. An attempt was made to induce him to relate the particulars of a murder in which he had participated, the wife of the murdered man being present at the hanging, and anxious to learn the details of her husband's death. To the persuasive efforts of the "regulators," and the tears and entreaties of the widow of his victim, he replied: "D—n it, you'll hang me if I tell, and

FIG. 17,—Dome-shaped cranium; mulatto. Brachy-cephalic.

you'll hang me if I don't. So here goes," saying which he deliberately kicked the barrel upon which

he was standing out from under himself and thus saved his self-appointed executioners all further trouble.

FIG. 18.—Skull of Western desperado. Sub-dolicho-cephalic.

This specimen is sub-dolicho-cephalic and chiefly characterized by its marked asymmetry.

FIG. 19.—Skull of Western desperado. Sub-dolicho-cephalic

The occipital region in this cranium is excessively developed, prominent and bulging, being especially prominent on the left of the median line. The occipital protuberance is situated about 8 m.m. to

the left. The parietal eminences are very asymmetrical, the right being very prominent and of irregular contour. The palatal vault is of medium height, the teeth regular and the maxilla well developed. The measurements are:

Cephalic index	77.8	
Circumference	50.3	c.
Anterior demi-circumference	21.9	c.
Posterior demi-circumference	28.6	c.
Transverse diameter	140.5	m.m.
Longitudinal diameter	180	m.m.
Bi-frontal diameter	105	m.m.
Bi-mastoid diameter	126	m.m.
Bi-zygomatic diameter	134	m.m.
Root of nose to occipital protuberance	312	m.m.
Over vertex between auditori meati	327.5	m.m.
Foramen magnum to sup. occipital angle	128	m.m.

FIG. 20.—Skull of Western desperado. Sub-dollcho-cephalic.

Viewed from above (Fig. 20), this cranium shows a fairly symmetrical outline. The above illustration is used for the purpose of comparison with Fig. 23.

The next specimen (Figs. 21, 22, 23) is by far the most interesting of the series from the standard of degeneracy, and is certainly the most markedly asymmetrical. If it were possible to conceive of a special criminal type of cranium, this would in many respects be an ideal illustration. The subject was a noted Western desperado and train-wrecker, who was lynched at Carbon, Wyoming, back in the seventies, for an attempt to wreck a train at Medicine Bow. In this attempt he was assisted by the individual represented in Figs. 18, 19, 20.

The extremely disproportionate breadth of this cranium is well shown by the above illustration. The meagre development of the frontal region is very noticeable. On viewing this skull from above, the peculiar twisted appearance which may be observed in connection with the cranial type of the criminal in general will be observed. The orbits are relatively large, and the face as a whole of a decidely "squatty" appearance. The absence of the inferior maxilla is to be regretted, although, considering the vicissitudes which the skull has experienced, its otherwise perfect state of preservation is rather remarkable. After the lynching of this gentleman the body was buried in a hastily improvised and shallow grave, from which it was very promptly resurrected by those scavengers of the prairie, the coyotes. The skull was finally found by a railroad employe, and subsequently used as a paper-weight for some years.

Judging from the conformation of the cranial and facial bones the lower maxilla, while probably well, or perhaps excessively developed, was without doubt asymmetrical. The relatively defective frontal development of this skull is its most striking feature when viewed in its anterior outline, and is best shown by comparison with Figs. 1, 2, and 6. In the former

FIG. 21.—Desperado and train-wrecker. Extreme Brachy-cephaly

the extreme breadth is 122 m.m., and the extrem. length 196.5 m.m., while the frontal breadth is 95 mm In the skull under consideration, however, althouge the extreme breadth is 149 m.m. and the extreme length but 171 m.m., the frontal breadth is only 90 m.m. The great disproportion in the measurements is at once obvions. In Fig. 6, the greatest breadth is 131 m.m., and the greatest length 181.5 m.m., yet the transverse frontal diameter is 95 m.m.

The disproportion is not compensated for in Fig. 21 by an increased longitudinal development of the frontal bone.

The twisted appearance of this skull is most evident on comparison of the parietal eminences. These are very prominent on both sides, the left being much the larger of the two. The occipital region is greatly deformed and exceptionally prominent, the bulging being most marked upon the left of the median line. The asymmetry of development is shown by a comparative measurement of the distance of each parietal eminence from the occipital protuberance. This measures on the right side 132 m.m.,

and on the left only 119 m.m. The squatty, animal-like type of this cranium is shown by a comparison of its vertical measurement with some of the others of the series. From the highest point at the vertex to the anterior border of the foramen magnum, the measurement is 118 m.m. That of Fig. 2, which is so distinctively anthropoid in its development and outline, the vertical measurement is 132 m.m.; of Fig. 5, a symmetrical brachy-cephalic type, is 145 m.m.; of Fig. 6, 118 m.m.; of Fig. 10, 140 m.m.; of Fig. 13, 148.5 m.m., and of Fig. 19, 136.5 m.m. A little study of these measurements will show the extreme

FIG. 22.—Desperado and Train-wrecker. Brachy-cephalic.

animality of type in this cranium, even as compared with others of a pronounced degeneracy of type.

Viewed from above, Fig. 23 shows the circumferential outline of this specimen. By comparing the quadrants of this illustration, the pronounced asymmetry of development is easily seen.

The superior maxilla in this skull is well developed, although the alveolar process shows an inferior development. The palatal arch is exceedingly low. The left superior maxilla is much smaller than

FIG. 23.—Skull of Western Desperado. Brachy-cephalic.

the right. The palatal processes show great asymmetry, the right being 16 m.m. and the left but 5 m.m. in breadth. The measurements of this cranium are:

Cephalic index	87.13	
Circumferential	49	c.
Anterior demi-circumference	20.35	c.
Posterior demi-circumference	28.65	c.
Longitudinal diameter	171	m.m.
Transverse diameter	149	m.m.
Vertical diameter	188	m.m.
Bi-frontal diameter	90	m.m.
Bi-mastoid	108.5	m.m.
Bi-zygomatic	132	m m.
Vertical circumference from ear to ear	279	m.m.
Center of left parietal prominence to occipital protuberance	119	m.m.
Center of right parietal prominence to occipital protuberance	132	m.m.
Anterior border foramen magnum to superior occipital angle	128	m.m.

MATERIALISM VERSUS SENTIMENT IN THE STUDY OF THE CAUSES AND CORRECTION OF CRIME.

Public Address before the Kentucky State Medical Society, Henderson, Ky., May 11, 1890.

When, in response to the courteous and complimentary invitation of your secretary, I promised to deliver an address upon the relation of materialism to the vice problem, I did not realize the difficulty of presenting views of a comprehensive character within the time allotted me. Since beginning my task, however, I have found that it will be impossible for me to present anything more than an array of generalities. These generalities, gleaned from an extensive range of thought upon this subject, I trust may at least serve as food for reflection.

Some years ago I published in the *Chicago Medical Journal and Examiner* a contribution entitled, "The Pathological Causes of Vice." This was based upon observations of the criminal class during my service as surgeon at the Blackwell's Island Penitentiary, and in other metropolitan institutions. This article, while well received by the majority of my friends in and out of the profes-

sion, invoked the wrath of a few orthodox individuals to such an extent that I was stimulated to further discussion and study of the subject. Fanatical opposition is sometimes an excellent evidence that our work is based upon sound principles.

In announcing myself as a materialist as far as the study of vice is concerned, I trust that my position may not be misinterpreted, for it is certainly not my intention to detract from the importance of the moral law in its relation to the production and repression of vice, or to lessen the efforts of the moralist in his attempts to oppose goodness to badness. It is the function of the materialist to liberalize the existing theories regarding the causation and repression of vice and to reduce the subject to a scientific and, as far as possible, evolutionary basis.

The study of the causes and prevention of vice and crime in their various phases is one of the most important and practical questions of the age. The varying forms of violation of physical, social, statutory, and moral law, which are included under the heads of *vice* and *crime*, are the outcome of certain circumstances of environment and laws of progression, which are, and have ever been present and operable in society; in all social systems, whether of high or low degree of development, and in every grade of civilization. It is obvious therefore that a philosophical study of vice is a social necessity, quite as much so as is the study of morbid conditions of our physical bodies resulting from aberrations of physiological laws. Indeed, the two studies are more or less interdependent, and therefore demand the interest of the physician as well as the philosopher. In my opinion it is to the physician, and not to the moralist or law-maker, that the society of the fut-

ure is to look for measures of repression or the better correction and prevention of vice and crime. Our knowledge of the causes and methods of prevention of crime is at the present time decidedly unsatisfactory and crude from a philosophical standpoint, chiefly because the science of statistics is yet in its infancy, and to a great extent because the moralist has acted as an obstructionist and has impeded the progress of those who have undertaken to reduce the question to a purely physio-philosophical basis.

I will at this point advance the proposition that the actions of man are governed entirely by the state of society in which they occur. Crimes are the result of precedent circumstances; they are the pictured and tangible results of occult influences, past, present and to come, *i. e.*, they are the result of an all-pervading, invincible and everlasting law. Criminal acts are not isolated experiences with no necessary antecedents or future repetitions.

The doctrine of free will, (*i. e.* of individual responsibility), is so simple and appeals so strongly to the self-esteem and sentiment of the masses that it is accepted by the majority of individuals with a faith and simplicity that prevails on no other question of corresponding magnitude. How simple and satisfactory it is for us to say that our fellow-man has committed a crime, because forsooth he is less holy than we! This Pharisaical sophistry is but the outcome of human egotism, and as long as it prevails and controls our social, moral and legal efforts at repression, so long will our criminal classes flourish and multiply. Indeed, "he who does not advance goes backward," and our social system is apt to grow worse instead of better.

It is hardly necessary to go into details regard-

ing the superficiality of the prevalent methods of study and repression of crime. It is so apparent that it must strike the most casual observer. Much has been done in the way of moral and physical persuasion, but very little indeed in the direction of philosophical methods of the study and correction of causes. As civilization has advanced and theology has become enlightened in its theory and methods, a corresponding improvement in the moral tone of the social body should be expected. Unfortunately, however, there has been no improvement—as far as statistics serve to testify—which is sufficient to encourage the efforts of the moralist to any great extent. The futility of moral measures, as demonstrated by past experiences, is explicable only upon the ground that there is something more than free will to account for criminal acts. Free will is operable only in the case of individuals, and moral persuasion affects only the individual and incidentally the circumstances which sway the volition of the criminal. It accomplishes little or nothing in correcting or antagonizing the general law underlying the production of the criminal class. By analogical reasoning the futility of moral means of repression may be readily shown. We will suppose, for example, that a certain portion of the human body is affected by disease dependent to a greater or less extent upon a depraved constitutional condition. Obviously measures of local correction, *i. e.* correction of the local depravity of tissue, although useful to a certain extent, fail of their object unless the general and constitutional influences which tend to enhance the local trouble are recognized and corrected. The individual is but an atom of the social fabric. When he is depraved, logic requires a search for, and if found the correction of the mor-

bid general or constitutional influences pervading social body which bring about perversion of thought and action in the individual. Moral persuasion is but a minor consideration; the law cannot cope with the question, and punishment is futile because these influences operate upon the isolated integer and not upon the law of causation. Admitting that certain criminals are so by reason of structural peculiarities, the inefficacy of preaching is at once explicable.

That criminality is the result of certain causal influences operating by a fixed law has been recognized by several eminent historical and statistical authorities. Buckle and Quetelet have advanced some striking arguments bearing upon the influences modifying the moral conduct of the human race. It would appear that many of the actions of mankind which we are prone to attribute to free will and independent action upon the part of the individual, are really the result of a fixed and immutable law controlling the moral world, almost as definite and arbitrary as the laws controlling the physical world. As compared with this law the independence, *i. e.*, free will of the individual and the local circumstances of environment in operation at the time of the apparently volitionary action, are of but little moment, and are but accidents in the chain of events. It has been shown by the statistics of Great Britain and France that there is a constant proportion maintained in the ratio of criminal acts to the number of population in those countries.

Rawson says: [1] "No greater proof can be given of the possibility of arriving at certain constants with regard to crime than the fact that the greatest variation in the proportion of any class of criminals at the same period of life during a pe-

[1] Inquiry into the Statistics of Crime in England and Wales.

riod of three years has not exceeded a half of one per cent."

Quetelet says: [2] "In everything which concerns crime the same numbers recur with a constancy which cannot be mistaken. This is the case even with those crimes which seem quite independent of human foresight—such, for instance, as murders, which are generally committed after quarrels arising from circumstances apparently casual. Nevertheless we know from experience that every year there takes place not only the same proportionate number of murders, but that even the very instruments with which they are committed are employed in the same proportion."

Buckle says: [3] "Suicide is merely the protection of the general condition of society; the individual's volition only carries into effect what is the necessary consequence of preceding circumstances. In a given state of society a certain number of persons must put an end to their own lives. This is the general law, and the special question as to who shall commit the crime depends of course upon special laws which however, in their total sections must obey the large social law of which they are all subordinates. The power of the larger law is so irresistible that neither the love of life nor the fear of another world can avail anything toward even checking its operations."

Buckle further shows by statistics that notwithstanding the varying causes of suicide which exist in society, such as political excitement, want, mercantile crises, disappointments in love, depression induced by disease, etc., there has been in London a very constant average of suicides, the average having been during five years 240

[2] Sur l'Homme, Paris, 1835.
[3] History of Civilization in England.

per year. The variation in the number was not very great in proportion to the number of population, running from 213 to 266, the latter number being attained in the year 1846, which was distinguished by the great railway panic. At this time the ratio of suicides might naturally be expected to be extremely high, but as a matter of fact, it was less than one-half per cent. higher than the preceding year. Mechanical laws may be disturbed by accidental disturbances, yet they prevail; so it is with the moral law.

As showing how the regularity in the course of events may manifest itself in the most trifling details of every day life one of Buckle's statements is very interesting. It is not infrequent for individuals through carelessness to drop undirected letters in the mail box. Such an oversight might naturally be attributed to individual carelessness, but it is shown by statistics that in London and Paris, due allowance being made for varying circumstances, increased population, etc., that there is practically the same number of undirected letters found in the mail every year.

It is generally supposed that in the matter of matrimony the individual is governed by free will. Statistics prove that there is a constant variation in the proportion of marriages corresponding to the rise or fall of the price of food products. So it may be seen from the foregoing that as far as statistical evidence goes we may well believe that "there is a Divinity that shapes our ends, rough hew them as we may.'

Leaving the question of a general law influencing society and determining with unwavering fidelity the occurrence of certain acts which we term criminal or vicious, it is unquestionably true that there are certain special causes in operation. The influence of heredity is so well recognized

that any remarks in that connection may be considered trite; it would however be impossible to do the subject justice without an allusion to it. It is not always an easy matter to isolate hereditary influences from others of a special character which operate in the development of vice and criminality, but there are certain typical cases upon record which conclusively prove that hereditary impulses to breaches of social ethics are a very important consideration in the study of the causes and prevention of vice. There is frequently an intimate association between hereditary defects of a physical character and those manifestations of heredity which result in crime. In many instances a special act of criminality can be directly traced to certain hereditary or perhaps congenital physical aberrations. The powerful influence of heredity in the production of vice and crime is not so manifest in this country as in some of the older countries of the world. Its influence is not so dominant among the higher classes, in countries in which a Republican form of government prevails as in those in which an effete monarchial and aristocratic system of control exists. The older and larger the city the more pronounced its viciousness. Thus it is to London we must look for the very refinements of vice and crime. The *expose* of the hideous orgies of Cavendish Square followed very closely upon those sensational murders of women which attracted the attention of the whole world to the great metropolis.

In Dr. Ireland's book, "A Blot on the Brain," we have evidence collated which is sufficient to convince any thinking man that the aristocracy of the Old World is hereditarily rotten to the core. My hearers may perhaps be familiar with his unmerciful handling of the House of the Romanoffs,

in which his statements are so eminently true that the sale of the book has been prohibited throughout the Russian domain. Not that the aristocracy *per se* are more liable to viciousness than any other class of people similarly situated. Unbridled license, idleness and the possession of unlimited resources, when taken in connection with the circumstance of consanguinity or in-breeding, are enough to account for the corruption of the dominant element in European society.

That actual physical aberrations or atypical conformations of structure must bear a certain responsibility for the development of the criminal class is amply shown by the researches of Benedict and Osler. These experimenters have shown quite a constant relation between atypical cerebral development and criminality. The assertion that criminals and a certain class of insane exhibit a defective or aberrant brain development, has been the conclusion of such students of the subject as Corre, Lombroso, Mills, Rousel-Marro, Pavlosky, Varaglin, Tenchini, and Badik. To be sure we must take into consideration the naive declaration of Benedict that certain of these cases were collected as the result of *a priori* conviction that the criminal is an individual having the same relation to crime, as his next blood kin, the epileptic, and his cousin, the idiot, have to their common encephalo-pathic condition. Hackneyed as the illustration may be there is as yet no better exemplification of the effects of heredity than that embraced in the wonderful tables and statistics of the immortal Richard Dugdale in his history of the Jukes.

Ribot, in his famous work on Heredity, has shown remarkable examples of an inherited predilection not only for crime in general, but of certain forms of crime and vicious impulses.

I perceive that my paper is spinning out to an unwarrantable length, and I will therefore present as briefly as possible those causes which students of this important social problem should always be ready to recognize.

1. The first cause is that occult all-pervading and remorseless law which pervades all social systems. To this law I would apply the old term *predestination*, were it not in my opinion too arbitrary an expression and likely to lay me liable to the impeachment of illiberality. This cause has already been sufficiently expatiated upon. There appears to be an occult influence of an epidemic character affecting chiefly the crimes of murder and suicide. This is so trite that I would scarcely mention it but for my desire for completeness of classification. There has recently occurred in rapid succession in numerous large cities in this country a considerable number of cases of wife murder followed by suicide. These are an illustration of a peculiar kind of homicidal mania of an apparently epidemic character which occurs now and then. It is my opinion, and in this I am not alone, that the public press fosters this epidemic influence by its blood-curdling accounts of such cases. It is a question in my mind whether the complaisant manner in which the *minutiæ* of robberies and defalcations are recited by the newspapers, has not its influence in producing crime.

2. Hereditary impulse independent of perceptible physical aberrations. It is possible that habit, persisted in through many succeeding generations, may result in a faulty power of reasoning, which, although not characterized by variations in physical conformation, may yet be transmitted through countless generations.

3. Defective physique and imperfectly developed intellect, hereditary or congenital.

4. Acquired disease lessening the moral sense and will power. Instances of this kind are familiar to all of us. Vicious or criminal acts performed under the influence of acute delirium or mania and due to various diseases, are frequently met with.

5. Injuries to the brain. This cause of crime and vice is a very familiar one, especially to the alienist and neurologist.

6. Alcoholism. To this cause there are many who, in what I consider illiberality, attribute nearly if not quite all cases of criminality. There is no question but that alcoholism is a potent cause of crime, but there are thousands of cases of criminal acts which are apparently traceable to it, yet in which the influence of alcohol is secondary to physical causes inherent to the individual. There were certain interesting facts brought out by the recent Congress of Alcoholism in Paris, which illustrates the importance of the study of the relation of alcoholism to crime. It was shown, for example, that there was quite a constant relation between the amount of alcohol consumed in various social systems and the amount of crime. It is my impression, however, from a study of the statistics developed by this Congress that the survey of the field of criminality had been rather a narrow one, and that certain collateral elements in the causation of crime had failed to receive their due need of consideration. Some of the studies of the Congress were rather interesting in this connection. For example, it was shown that in Berne, where there are only four saloons per thousand of inhabitants, criminality was more prevalent than in Zurich, where the proportion is 12 to the thousand.

7. Vicious example and surroundings—environment. This involves the question of criminal contagion, which is very important in connection with our own defective methods of correction. The herding together of all grades of crime is one of the most pernicious systems that could be devised. In our own city of Chicago, for example, there is no reformatory for young lads, and they are therefore sent to the Bridewell, where they eventually become contaminated by older criminals. This proceeding is as rational as would be the sending of a case of sore throat to a diphtheria hospital.[4]

8. Defective education and consequent imperfect mental discipline. This is a question on which the progressive physician and the philanthropic politician, if such *rara avis* exists, should be a unit.

9. (*a*) Perverted conception and mal-administration of the law. (*b*) Unjust dispensation of the law, statutory and moral. Illogical interpretation of divine law. This cause is of more importance than is usually assigned to it. What may be termed the inequalities of Justice have been responsible for fully as many cases of confirmed criminality as almost any other cause which could be mentioned.

Bishop Robertson once said: "Justice is a pair of huge iron jaws which open and close with mechanical regularity. Nearly every man at some time in his life comes within the legitimate reach of these jaws. Many escape just at the nick of time because they do not happen to be within reach at the time the jaws are open and closing, while others less guilty perhaps, but also less fortunate, are caught."

[4] A movement is now on foot to establish a reformatory in Chicago

A very interesting story is told in this connection of two school boys who were stealing apples together. They were detected and pursued. One was caught, while the other one escaped. The one who was captured was sent to jail and thrown among criminals from whom he acquired a moral contagion which infected his after life. After his release those acts which before his incarceration were merely boyish pranks, assumed a criminal character and he became a confirmed criminal. The boy who escaped remained in school and doubtless kept up his mischievous tricks during his school days. He afterward studied law, became a lawyer, and eventually was elected a judge. Twenty-five years after the apple stealing episode the judge sentenced his former comrade to death for murder.

10. Alleged detective science or man-hunting. The manner in which the ambitious modern would-be detective pursues discharged criminals is an apt illustration of "man's inhumanity to man." How frequently it transpires that a criminal leaves the prison gates with the resolve to lead an honest life; he secures a position but the eye of the law is still upon him, and some human tiger in the guise of a detective speedily warns his employer that he is harboring a jail bird. Discharge follows, and perhaps another place is secured with the same result, and so the relentless pursuit goes on and on until the jail bird finds every avenue closed to him except the road back into the jail. Why have we not a Hugo among us to describe the pursuit and persecution of our own Valjeans? It is unquestionably true that the persecution of criminals by would-be Vidocqs does much to keep up the census of our jails. A want of faith in reformation on the part of those who should hold out a helping hand to

the criminal, drives many a man back to crime.

11. Physical, moral, social, and matrimonial *mésalliance*. This involves the question of consanguinity. It is questionable whether we as physicians will ever succeed in accomplishing much in the correction of this particular cause. The sanitary marriage is the dream of the idealist. If we shoot at the moon however, we may make a pretty satisfactory target though we fall far short of the mark. Gross physical infirmities and certain pronounced mental defects may at least be taken into consideration in the question of matrimony. Proper selection in marriage means means both physical and mental improvement in the race. The human animal is certainly entitled to some of the benefits to be derived from the science of breeding. Authorities are somewhat divided upon the question of consanguinity, yet there are few who are not willing to admit the necessity of careful and ripe judgment in considering the question of the marriage of blood relations.

12. Aberrations and perversions of a sexual character are occasionally the cause of crime, more frequently perhaps than is generally appreciated. Many cases of murder from alleged jealousy are due to sexual insanity. Rapes and various crimes of a bestial character may be due to inherent perversion or to actual insanity. There are many illustrations of crime committed as a consequence of inherent sexual perversion.

13. The intermarriage of criminals. As much as has been said upon this question, it is doubtful whether the correction of this influence by the State is possible. If the privilege of matrimony be denied to the criminal class, illegitimate relations are apt to be established with an even more deplorable result. Such people are not apt to

stand on ceremony, and the correction of this cause is therefore more theoretical than practised.

14. Corruption in politics. Under this head I will embrace political encouragement of ruffianism and protection for criminals. A very sad case recently occurred in Chicago of a prominent lawyer who became insane as a consequence of a blow upon the head inflicted by an alleged respectable citizen during a quarrel of a political character. As a corollary of political corruption we have an imperfect and corrupt police system, the keystone of which is the axiom that it takes a rascal to catch a rascal. This cause of criminality must prevail as long as the credentials of an alderman are the qualities of a deep, hard drinker and a good rough-and-tumble fighter.

15. Niggardly and misapplied charity, with consequent failure to relieve actual want. As is well known, starvation and crime are first cousins.

16. The importation of the criminal refuse of the Old World, and what is worse, individuals with fanatical social, political or religious views. The important question of immigration demands more attention than is usually accorded it. It is really one of the most vital issues of the day. The instance has been known, and quite recently, that nearly ten thousand immigrants were landed in one day at Castle Garden alone, to say nothing of other ports of entry. Were it established that all of these people are respectable and producing elements in American society, they would certainly be a very valuable addition to our population. There is something striking however, in the fact that, although the foreign-born citizens constitute but one-eighth of the total population of the country they furnish one-third of our criminals, one-third of our paupers, and one-third of our insane. In short, the character of our immigrants

is so polluted by the wholesale exportation by the Old World of the insane, criminal and pauper class, that every one thousand immigrants furnishes twenty per cent. more of the inmates for our jails, asylums and alms-houses than the same number of American born. This is a cause which must be grappled with by the statesman and not by the philanthropist. Should politics become honest, or approximately so, there is hope for remedying this evil, but under the present system of political quackery a remedy for this cause is like some of the others I have mentioned, more theoretical than practical.

In this array of generalities and necessarily imperfect classification of causes of vice and criminality, it is obviously impossible for me to entirely cover the field, but if I have succeeded in presenting in an intelligible manner ideas which will serve as an incentive for the study of the subject on the part of my intelligent readers, I shall have accomplished my object. As Dumas once said of mendicity: Criminality is "an organized body, a kind of association of those who have not, against those who have." It is high time that the respectable elements of society should begin the study of the causes and prevention of crime in a philosophical manner. If this be done and the philosopher, preacher, statesman, jurist and physician put their shoulders to the wheel and work in unison, the time may come when the criminal class may not be so pronounced a curse in our social system as it is to-day.

THE RATIONALE OF EXTENSION IN DISEASES OF THE SPINAL CORD, WITH METHODS FOR SECURING THE SAME.

It is hardly necessary to go into details regarding the history of the modern method of treatment of diseases of the spine by extension. It is my purpose in the present paper to devote attention chiefly to locomotor ataxia, this being the disease for which extention of the spine has of late been most frequently employed. Not being a specialist, either in nervous diseases or orthopædics, my object in the publication of this paper is merely to offer what I consider to be a logical explanation of the action of extension of the spine in the treatment of diseases of the spinal cord, and to present a method of extension which I am convinced is the best. Extension of the spine as the treatment for locomotor ataxia was first introduced by Motchoukowski, of Odessa, in 1883. The method of extension which he adopted was by the use of the suspension apparatus originally applied in Pott's disease of the spine by Dr. Joseph Bryan, of Bellevue Hospital (now of Kentucky), from whom tradition says it was pilfered by the more or less celebrated Sayre, of New York. Within the past year the renowned Charcot, of Paris, has adopted this method of suspension in locomotor ataxia. Many prominent American neurologists have experimented extensively with the method and have indorsed it as a rational and successful measure of treatment. Dana and Morton, among the neurologists, and Charles F. Stillman,* the

* Recently deceased.

well-known authority upon orthopædics, have written quite extensively upon the subject.

In an excellent article upon the mechanics of extension of the spine, Stillman presents the present status of extension in locomotor ataxia, summing up with the statement that "the precise effect of suspension upon the spinal cord and nerves in this disease is not as yet determined." Motchoukowski believes that the improvement noticed in his cases is due to "an increased activity of the circulation induced by suspension." He observed an increase of arterial tension with increased rapidity of pulse and respiration during suspension. He states also that in experimenting upon the cadaver he produced a lengthening of the spine between the second cervical and fourth lumbar vertebræ of two and one-half centimeters. The consensus of opinion has been corroborative of the foregoing, it being generally believed that the improvement in circulation and in the nutrition of the spinal cord to which the improvement in the symptoms is attributed, is due to a stretching of the spinal cord proper. Dr. Dana* indorsed the method in a rather lukewarm fashion and states that "it is a method of treatment which is inferior to others in our possession." Dr. Morton† says, "the subject is just entering upon its experimental and clinical stage, but if we accept the facts thus far reported and if they prove to be accurate in a large number of cases we shall be compelled to admit that the sum total of improvement is far in excess of that attainable by any previous means."

This author is seemingly on the fence as far as the explanation of the therapeutical action of extension of the spine is concerned. He asks: "What are the effects of suspension upon the healthy spinal cord? What the cause of the effect upon the diseased cord? Is it due to a diminution of the irritibility of the cord by stretching it? Can or cannot the cord be actually elongated?" Waitzfelder‡ says: "It is hardly reasonable to suppose that the cord itself is stretched, for it floats so freely in the spinal canal that the counter-

* *Medical Record*, April 13, 1889.

† *Medical Record*, April 13, 1889.

‡ *Medical Record*, April 13, 1889.

extension of the weight of the body is notsufficient to produce that result without the greatest pain. It is more likely that the traction exerted on the spinal nerves in some way brings about a change in the circulation and nutrition of the cord, and the amelioration of the symptoms is due *to a lessening of the vascular supply of the cord and its membranes.** The *Journal of the American Medical Association* for September 7th, 1889, states that "the rationale of the treatment is not very evident. Experiments have shown that on the cadaver at least the vertebral canal is sufficiently elongated to exert slight traction upon the spinal cord by the nerve roots, but why this should be beneficial is not quite clear." Althaus thinks that "the improvement is due to a breaking up of adhesions in the meninges and neuroglia."†

I fail to see how any of the explanations of the mechanical cause of improvement in the nutrition of the cord which have thus far been offered in the consideration of the treatment of locomotor ataxia by extension, can be consistent with our knowledge of the anatomy of the spinal column, the spinal canal and its contents. I do not believe that it is possible by stretching of the spinal column to exert sufficient traction upon the loosely attached spinal cord either to stretch it, or secondarily to stretch the spinal nerves. It certainly appears to me absolutely impossible to exert a traction force upon the cord through the medium of the spinal nerves. Indeed, the structure of the spinal canal and its contents is such apparently as would defeat any attempt at direct traction upon the cord or its nerves. The spinal cord does not completely fill the spinal canal, its investing membranes being invested by areolar tissue and a rich plexus of veins and capillaries which separate the cord from the bony walls of its canal. As compared with the length of the spinal canal the spinal cord is relatively very short, extending only from the foramen magnum to the lower border of the first lumbar vertebra.

It is unquestionably true, as proven by experiments upon the cadaver, and as I have observed in experi-

*Italics mine.

†Editorial.

ments upon the living subject, that the spinal column can be extended. Now, if this extension produces improvement in the general circulation and in the nutrition of the spinal cord, and if, moreover (as I believe), it is not practicable to exert sufficient traction to stretch the spinal cord or its nerves within the limits of safety, there seems to be some other explanation of the action of extension. I believe that extension does produce both local and general improvement in nutrition, but I do not believe that this result is attained through traction upon the cord or the spinal nerves. The spinal column is composed of a number of firm, bony segments united together by elastic and inelastic structures. The elastic bonds of union between the vertebræ (chiefly the ligamenta subflava) are the media through which extension of the spine is possible within certain limits. The inelastic structures, although perhaps extensible within certain limits, are the principal agents in limiting the range of elasticity of the ligamenta subflava. In a general way it may be said that the vertebræ constitute the rigid segments of the spine, while the intervertebral tissues and ligaments constitute the extensible and more or less elastic segments of the spine. These segments constitute the walls of a canal which in its entirety is quite capacious. Admitting that it is perfectly practicable to lengthen the spinal column, it is a self-evident fact that the cavity in which the spinal cord and its investments rest, is increased in its capacity to a degree proportionate to the lengthening of the spinal column. The increase of capacity would be represented by a cylinder of a length corresponding to the increase in the length of the spinal cord when fully extended, with a mean diameter corresponding to that of the spinal canal. This will be admitted by all who believe that lengthening of the spine by extension is practicable. This fact having been admitted, its corollary is at once obvious. There is formed a vacuum of greater or less capacity within the spinal canal, the result of which is an aspirating or suction force along its entire length. The simplest of physical principles explains the rest. There is an active determination of blood to the part, with a consequent stimulation of the functions of the cord, and an improvement in its nutrition which lasts for some

time after the tension upon the spinal column has been removed. An incidental element in the improvement of nutrition is a lessening of resistance to the venous flow. The effect of an increased *vis a tergo* and a diminished *vis a fronte* is at once apparent.

The improvement in the general circulation incidental to extension, if properly performed, is very evident even to a casual observer. The extremities, which in locomotor ataxia are cold and show evidences of faulty circulation, grow warm and redden during the continuance of suspension. This improvement in circulation will be observed to remain for a greater or less length of time after suspension is stopped. The pulse will be found, during extension of the spine, at least by the method which I am about to indorse, to grow more frequent and fuller; respiration is also increased.

The so-called Sayre method, as advocated by Motchoukowski and Charcot, is in my opinion a very faulty one, and is by no means free from the element of danger. Some four or five cases, if not more, have been reported in which death has occurred as a direct consequence of shock of asphyxia induced by the suspension method. The method is certainly painful and the risk, considering the number of deaths that have occurred from it during its short existence, is considerable. The traction upon the spine is exerted in an indirect manner. It is produced solely by longitudinal traction, no attempt being made to take advantage of certain mechanical principles which can be applied to the spine. The method certainly entails hard work upon the patient, the first principle of treatment of locomotor ataxia, viz.: rest, being disregarded. The disproportionate strain upon the cervical portion of the spinal column is considerable. There seems to be a tendency to attempt stretching and straightening of the spinal column by traction upon this relatively short and fragile region of the spine. Not only is this region of the spine rather delicate, but traction upon it involves tension upon certain very important nervous, vascular and muscular structures of the neck.

In addition to the increased capacity of the spinal canal, incidental to extension of the spinal column, there is an increase of capacity due to a thinning of the various intervertebral structures. The straighten-

ing out, the stretching and unfolding of the various ligaments of the spinal column enhances the aspirating effect upon the spinal column as a whole as well as upon the spinal canal.

That stretching of the cord is not the essence of the beneficial result is, I think, conclusively shown by the circulatory effect of extension. Stretching of a nerve does not heighten its functions, *per contra*, it inhibits them temporarily. The results of stretching the sciatic show this.

In considering the mechanics of the treatment of locomotor ataxia by extension of the spine, it is necessary to consider the fact that, according to my theory, it is not necessary to bring to bear upon the spinal column extreme and painful tension, it being only necessary to bring about such a degree of lengthening of the spinal column as will secure the aspirating effect which I have described. Anotner point which should be taken into consideration (and this is especially pertinent in extreme cases), is the position which the patient involuntarily assumes. There is a tendency not only to flexion of the spine but of the limbs. Thus the spine is curved backward, so that the patient has a decidedly round-shouldered appearance; the forearm tends to become slightly flexed upon the arm; the hands tends to droop, the fingers being held in a semi-flexed position; the thighs somewhat flexed upon the abdomen; the legs upon the thighs—there is a decided curve of the feet. I am now describing typical cases which in many instances are bedridden. This general tendency to flexion, however, may be observed in cases of moderate severity.

This flexion of the spine is probably nature's method of supporting the spine in this disease. It is analogous to the hyper-extension of the spinal column observed in that form of Pott's disease in which the bodies of the vertebræ are chiefly affected. This condition of flexion of the spine must be corrected by our measures of extension, else the treatment will hardly prove efficacious. Obviously it would be very difficult to extend this curved column without reducing in a great measure its abnormal, and for that matter, normal curves. To attempt to straighten the spinal column by a pulling process alone is not com-

patible with the best results nor with the intelligent application of simple mechanical principles.

The method of extension of the spine introduced by Dr. Charles F. Stillman, of Chicago, not only permits of the application of the proper mechanical principles to the process of extension of the spinal column, but also permits of the application of the treatment while patient is practically at rest. It is a perfectly safe method and is so much more comfortable and efficacious than the so-called Sayre method that, a patient having once tried the improved process will scarcely submit to the pain and inconvenience incidental to suspension.

In explaining the advantages of his method, Dr. Stillman says: "The spinal canal is posterior to the main portion, *i. e.*, the bodies and the intervertebral cartilages of the vertebral column, and this is an anatomical feature to be emphasized, because on account of this arrangement it is plain that a given amount of traction exerted on the column in an anterior curved position (this anterior curving or flexion being the most extensive of any of its movements and freely permitted in the cervical and lumbar regions), must result in greater elongation of the cord itself situated behind the vertebral bodies, than an equal amount of traction exerted with the spinal column in any other position.

As I have observed under the manipulations of Dr. Stillman, the spinous processes will be found to separate quite appreciably. The point to which I take exception in Dr. Stillman's description is the assertion that this method results in greater elongation of the cord. This I do not believe, for, as I have already claimed, I think it is the aspirating effect which is secured upon the spinal canal and not an elongation of the cord that produces the beneficial results. I am inclined to accept the assertion that traction upon the board with the patient in the prone position secures the greatest possible increase in the capacity of the spinal canal. A bending of the spine anteriorly will force the anterior edges of the vertebral bodies together to such a degree as to neutralize perhaps to a certain extent the apparent elongation of the spinal column as a whole, as evidenced by the separation of the spinous processes, but such a tipping together of

the vertebral bodies will necessarily result in a relatively wide separation of that portion of the vertebræ enclosing the spinal canal. While this separation therefore is not a perfectly reliable criterion of the degree of extension of the spinal column it increases the capacity of the canal.

Stillman has recommended not only gymnastic treatment while the patient is subjected to traction upon his curved board, but also the application of electricity and massage.

Obviously these methods of treatment are most efficacious at the time when the patient's vitality has been heightened under the influence of proper traction ; or, according to my views, under aspiration of the spinal canal by elongation of the spinal column.

In conclusion, I will present, and at the same time, indorse the résumé given by Dr. Stillman in a recent paper read before the Chicago Medical Society.* In addition to constitutional treatment in locomotor ataxia there should be employed .

1. Both the erect and recumbent curved traction frames as being superior both in principle and practice to the so-called Sayre suspension apparatus, employed by Motchoukowski and Charcot.

2. Traction while the spine is curved anteriorly to produce the greatest possible degree of elongation of the cord and spinal nerves (?) consistent with a requisite amount of rest, comfort, and freedom from danger.

3. Traction while the spine is curved posteriorly to increase the vital power.

4. Appropriate gymnastic exercises during the curved traction to restore impaired muscular function and to improve general nutrition.

5. Appropriate forms of electricity and massage while traction and rest are being practiced.

I would suggest, as an additional factor in the treatment, that such exercises be selected as will increase the chest capacity, as we thus take advantage of the improvement in circulation and hæmatosis incidental to exaggerated respiration. The pulleys introduced by Dr. Stillman are efficacious in this procedure, providing the proper means are secured.

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* Trans. Chicago Med. Soc. Dec. 2d, 1889.

TROPHO-NEUROSIS AS A FACTOR IN THE PHENOMENA OF SYPHILIS.

In studying some of the late or sequelar lesions of syphilis, particularly those involving changes in the oseous structures of the head and face, I have been forcibly impressed by certain characters of the lesions which seem to depend upon a more occult series of pathological changes than those to which they are usually accredited. Some of these characteristics also pertain to many of the lesions of the active or secondary period of syphilis.

The relation of certain syphilitic phenomena to organic or functional disturbances of the nervous system—and particularly the sympathetic system—is certainly manifested here and there along the whole line of morbid phenomena developed in the course of the disease. The syphilitic fever, so-called, while an inconstant phenomenon, is present in a sufficient number of cases of the disease to practically settle the question of the relation of cause and effect. The symptoms which collectively we designate syphilitic fever, are, in common with some other febrile constitutional disturbances, undoubtedly dependent upon the action of a special poison upon the sympathetic nervous system. It is logical to infer from what we know of the physiology of the sympathetic system, and particularly of those functions of the sympathetic which we term trophic, that the majority of fevers—if not all—are directly dependent upon the action of the specific poison upon the sympathetic ganglia, which action is manifested by disturbed metabolism and the resulting phenomena of fever. So in the case of syphilis the poison may produce so profound an impression upon the sympathetic ganglia that the

trophic function of this portion of the nervous system is disturbed, with an attendant perversion of tissue metabolism, a resultant excessive production of animal heat and the accumulation in the system of the toxic products of perverted physio-chemical change. The fact that the so-called syphilitic fever is not a constant phenomenon, but affects only a certain portion of individuals attacked by syphilis is explicable upon the ground of idiosyncrasy.

The argument that the syphilitic fever is the result of an impression produced by the syphilitic poison upon the sympathetic nervous system does not necessarily imply—nor do I intend it to do so—that the syphilitic fever is a part of the natural course of the disease. On the contrary, I believe that it is accidental and the result of idiosyncrasy. We know that different individuals are variously affected by the constitutional impression of organic poisons. Certain individuals are affected by urticaria or erythema upon the ingestion of shell-fish, this result being particularly apt to follow when the particular article of food is not perfectly fresh or was not in an absolutely healthy condition when taken for food. Some persons are seriously affected by the ingestion of certain vegetables—particularly if partial decomposition has occurred. Canned vegetables, and especially tomatoes, are especially liable to impeachment upon this ground. If it is fair to infer that by virtue of idiosyncrasy the nervous system of certain individuals may be morbidly impressed by certain food substances which are innocuous to the majority of individuals, it is certainly fair to assume that in the case of so powerful an organic poison as that of syphilis, with which a large number of individuals are inevitably inoculated, certain special and exceptional phenomena might be produced in some persons.

Attendant upon or following the syphilitic fever, or occurring independently of it, we have a characteristic manifestation of syphilis, which in cases unmodified by treatment is probably always present in greater or less degree. I refer to the syphilitic roseola. This eruption has been shown to be unlike the other phenomena of syphilis in that it is dependent, not upon a localized collection of proliferating syphilized cells, but upon vaso-motor disturbances, the essential

objective element of which consists in dilatation of the capillaries in localized areas of the skin. This, as far as we are able to positively determine, is dependent upon the impression of the syphilitic poison—virus, bacillus, degraded cell, or whatever term may be selected to designate it—upon the central sympathetic system. This impression is essentially the same as that produced by certain vegetable poisons. It is not, however, dependent upon idiosyncrasy, although it may be modified by it; thus we find in some individuals a very marked roseola, in which the lesions are disseminated over a large area of the integumentary surface and are very prominent and well-defined; whereas in others we may find upon close inspection perhaps but a single lesion. The gradations between the two extremes are very various. Idiosyncrasy might be quite plausibly advanced as the explanation of this wide variation.

The action of certain drugs given for medicinal purposes is a further illustration of the results of various poisons upon the sympathetic nervous system as manifested by the appearance of morbid cutaneous phenomena. Belladonna, quinine, opium, copaiba, chloral, salicylic acid and numerous other drugs have been found to produce, in exceptional cases, an efflorescence upon the skin. The rarity of such phenomena, in conjunction with other proofs of idiosyncrasy and the known properties of these various drugs as far as their action upon the skin is concerned, are positive evidences of their neurotic character.

The lesions of syphilis which succeed the roseola have been so positively demonstrated to be dependent upon a localized deposit and proliferation of syphilized cell mat rial that it would appear to be impossible to apply the neurotic theory to them. It is only necessary, however, it appears to me, to direct attention to the marked symmetry which characterizes the peripheral phenomena of syphilis to at once suggest the probability of a central nervous element in the production of the various lesions. It is, to be sure, admitted that a symmetrical development of eruptive lesions occurs in some other affections. It will be found, however, that a nervous element is either positively demonstrable, or the skin lesions are so abun-

dant and general that it would be impossible that they should be otherwise than symmetrical.

As a most positive proof of the relation of eruptions of the skin to nervous disturbance of a presumably trophic character, I have but to allude to herpes zoster. In this disease we find an accurate delineation of the course of the affected nerve by the eruption, and a very manifest local disturbance of nutrition of the affected tissues. Generally some portion of but one side of the body is affected by this disease. It is sometimes bilateral and consequently of a more serious character than usual. Some of the later lesions of syphilis are unilateral, and as will be shown by a case shortly to be related, almost as plainly referable to the distribution of a particular nerve as is the case with herpes zoster.*

Recurrent herpes zoster is especially pertinent to the question of tropho-neurosis. This disease is usually followed by cicatrices. The first symptom is a burning sensation followed by severe neuralgic pains. Injury is often the exciting cause and it is frequently bilateral. I have elsewhere claimed that herpes progenitalis is often the result of syphilis—being moreover a pure neurosis, due 1st. to syphilis, 2d. to worry, 3d. to over active therapeusis.† These causes bring about disturbed innervation and nutritive disorder.

Professor Otis, following Besiadecki and others, has shown that the predilection of syphilitic material for the papillæ of the skin, is due to the fact that it is at this point that the arterial, venous and intervening lymphatic capillaries come into the most intimate contact; in other words, that it is in the papillæ of the skin that the narrowest points in the circulatory and lymphatic flow are to be found. The affinity of the syphilitic process for lymphatic structures explains the rest, and we have at various points in the superfices of the body a localized heaping up of the so-called syphilized cells. We have, however, in the roseola, localized and circumscribed phenomena,

*Duplay, Raymond and Leloir report cases of nervous syphilis preceded and heralded by herpes.

† Paper read before North Texas Med. Soc., Feb. 8, 1890. *Phila. Med. News.*

which are not satisfactorily explicable upon anatomical grounds. Why does not the roseola appear in one continuous blush over the entire surface of the body? Is it not because the impression of the syphilitic poison upon the system is manifested through a vasomotor disturbance of the function of the sympathetic ganglia at certain terminals in the skin? Dr. Otis accepts the neurotic origin of the roseola, and it is a matter of surprise that he should seek for a local anatomical explanation of the development of, for example, the syphilitic papule. In view of the logical explanation of the roseola, would it not be fair to infer that a similar condition of affairs prevails in the case of the other eruptions?—i. e., that as a consequence of an impression made by the syphilitic poison upon the sympathetic ganglia, their trophic functions are disturbed with a consequent disturbance of nutrition and perverted tissue building at certain points upon the periphery or superfices of the body? I do not know whether this explanation of the secondary eruptions of syphilis has ever been advanced, but it has for some time appeared to me to be the most logical explanation of the phenomena of syphilis. It is particularly satisfactory from the fact that it covers not only the roseola and papule, but every other lesion which may occur throughout the entire course of syphilis.

There is perhaps no morbid phenomenon characteristic of active syphilis, which is more difficult of explanation on purely mechanical grounds, than the alopecia which occurs during the secondary period. Very few cases, if any, which are unmodified by treatment, escape this disagreeable symptom of the disease. Indeed, under the most careful and scientific treatment, a greater or less degree of alopecia is frequently observed. The shedding of the hair is limited chiefly to the scalp. The eyebrows are affected, but the beard is little if at all involved, as a rule. Other hairy parts of the body are not generally involved, even though there may be quite a general eruption over the surface of the body. Should destructive lesions occur in any situation supplied by hair, a temporary or even permanent shedding will be likely to result. The manner in which the hair is shed from the scalp, is most striking and characteristic in most

cases; instead of there being a general shedding, the process seems to affect the scalp in spots, as a consequence of which, the head assumes an embarrassing piebald appearance, which he who runs may read. Otis and others attribute this alopecia to an accumulation of syphilized germinal material in and about the hair follicles, this deposit producing mechanical impairment of nutrition of the hair, as a consequence of which it is cast off.

Strange to say, however, if this theory be correct, lesions of the scalp of sufficient prominence to attract attention are quite rarely associated with alopecia. A few small papules, pustules and crusts are occasionally found, but hardly ever in sufficient amount to account for the extensive falling of the hair. It will be found, to be sure, that at the site of such lesions the hair invariably falls out. Now it seems to me, that if the syphilitic material had such an affinity for the scalp as would be indicated by the theory of localized cell deposit, the cutaneous lesions of this portion of the integumentary surface would be especially pronounced. It is hardly probable that in the presence of such an affinity for the hair follicles, a deposit of syphilitic material would accumulate to such an extent as would be sufficient to deprive the hair follicle of nutrition and yet fall short of a sufficient amount to be perceptible externally. There may be, it is true, more or less accumulation of germinal material in the hair follicles, but there yet remains the necessity for an explanation of its deposition in this location.

From these considerations I have been led to believe that the alopecia of syphilis is precisely similar to that which occurs in other diseases as a consequence of local malnutrition incidental to disturbed nervous supply and general malnutrition. In certain fevers, for example, shedding of the hair is quite common during convalescence—perhaps well along in the period of convalesence. This is due to a general perversion of nutrition which must necessarily affect an epidermal structure of a low grade of vitality, such as the hair. This perversion of nutrition is in my opinion due to a greater or less extent to disturbance of the functions of the sympathetic nervous system—in other words, to tropho-neurosis. Various morbid dis-

turbances of the nervous system are known to effect the vitality of the hair. Thus fright has been known to induce a blanching of the hair, unquestionably dependent upon perversion of the functions of the sympathetic ganglia. Neuralgic affections of the head are well known to produce both blanching and falling of the hair, perhaps limited to the distribution of the terminal filaments of a single nerve. As a further illustration of the relation of malnutrition, probably dependent upon perversion of the functions of the sympathetic nervous system to falling of the hair, may be mentioned the alopecia resulting from the excessive use of arsenic internally.

The relative immunity which the beard of the male enjoys as compared with the hair of the scalp, is probably dependent upon the greater intrinsic strength of the hair growth and the higher vascularity of the tissues of the face.

Traumatism may cause alopecia areata by an impression upon the sympathetic system. Leloir, Dumesnil and others have recorded cases of this kind. Joseph's experiments are quite significant in this connection. This experimenter divided the spinal ganglion of the second cervical nerve in cats and thereby produced baldness.

It would appear that syphilitic infection not only has a peculiar affinity for the sympathetic nervous system, but that this affinity is particularly marked in the case of the upper or cervical portion of the sympathetic. The proportion of lesions about the head, face and mouth, is relatively much larger, even under the best of treatment, than in other portions of the body. The parts supplied by the fifth cranial nerve appear to be particularly susceptible. Very many of the cases with which I meet in private practice escape, under appropriate treatment, general cutaneous eruptions. Few, indeed, no matter how thoroughly they may be treated, are not affected at one time or another with lesions of the lips, inner surface of the cheeks, tongue, throat and scalp. I find that a certain degree of falling of the hair, sore throat and mucous patches are to be anticipated in spite of the most careful treatment in the larger proportion of cases.

I have had in my experience very few cases in which with conscientious attention to treatment the

patients have been annoyed by cutaneous eruptions, bone lesions, etc., but I have had a number in which oral and pharyngeal lesions proved a source of great annoyance. Even in the late and sequelar syphilides this same predilection for the structures of the face and throat is manifest. Cases are frequently met with in which the initiatory and active periods of the disease have been passed through without serious trouble, when suddenly and without warning, serious destruction of the nasal, palatal and maxillary bones has developed. Many cases of serious destructive ulceration of the pharynx are met with as remote manifestations of syphilis in cases in which annoyance has been escaped during the earlier periods of the disease.

The affinity of the syphilitic process for the iris may possibly be explicable from the important function of those filaments of the sympathetic system supplied to this part. In other words, the local accumulation of cells in the iris may be incidental to disturbances of nutrition dependent upon the impression of the syphilitic poison upon the central sympathetic system.

Even in congenital syphilis we can see evidences of tropho-neurotic disturbance. The peculiar affinity of the syphilitic process for the epiphyso-diaphysial junction of the long bones is strikingly suggestive. It is here that the processes of growth and nutrition are most active and tissue-building the most rapid. It is consequently at this point that disturbance of the trophic function of the sympathetic which presides over the physiological processes of nutrition and growth would be most likely to be manifested by pathological change. A perversion of the function of the sympathetic would result in imperfect differentiation of the cells of the part, and as the rapidity of proliferation of cells is in inverse proportion to their degree of differentiation a heaping up of the young material is to be expected. Associated with this imperfect differentiation of cells, we have a tendency to degeneration, for it may be formulated that the tendency to degeneration is also in inverse ratio to the degree of differentiation. This imperfect differentiation with a consequent tendency to degeneration of young germinal material is the characteristic feature

of all the lesions of syphilis, no matter in what stage of the disease they may develop.

The physiological effects of the remedies upon which we depend for the cure of syphilis are evidences of the neurotic character of syphilitic phenomena. It is shown that mercury and iodide of potassium, although very efficacious in syphilis, are in no sense directly curative, their beneficial effects being dependent upon their power of inducing fatty degeneration and elimination of the products of the syphilitic process rather than upon any special controlling or antidotal effect upon the poison *per se*, whether this poison be a virus, germ or cell. In reviewing the opinions of our best syphilographers regarding the treatment and prognosis of syphilis, one is impressed with the idea that syphilis is a disease which runs a natural course in spite of treatment, the physician being incapable of doing more with his remedies than to remove the effects of the disease as fast as they appear, thus preventing as far as possible permanent damage to the affected tissues. As far as aborting the natural course of the disease is concerned, he is absolutely helpless, and apparently his success in the treatment of the disease is inversely to the vigor of his attempts to antidote or stamp it out.

If the neurotic theory of the essential condition in syphilis be correct, we have, in our efforts to discover a specific remedy for syphilis, been necessarily led away from those lines of research which would lead to a correction of the principal element in the production of the syphilitic phenomena. The severity of the results of syphilis would appear to depend (1) upon the individual susceptibility of the nervous system of the patient; (2) upon his constitutional condition, and, incidentally, on the resisting power of his tissues; (3) upon the action of remedies; this being by no means the most important consideration.

The involvement of the fauces and pharynx characteristic of secondary syphilis, has been explained upon the ground of lymphatic engorgement, the primary cause of which is the abundance and superficial character of the lymphatic capillaries of the affected parts. It is a noteworthy fact, however, that there is but little swelling, pain and tenderness accompanying the syphilitic sore throat, provided ulcers be absent.

There is also, in the early part of the disease, little or no tendency to ulceration in the majority of cases. There is comparatively little heaping up of syphilitic material. These characters would lead one to suppose that there is something behind the localized proliferation of cells—if such exist—something, too, which will explain the appearance of morbid phenomena at this particular point aside from mere anatomical pecularities. For obvious reasons it has not been clearly shown whether the same efflorescence and engorgement does not occur in the other portions of the alimentary canal in the early period of syphilis. Admitting that there is a diffuse accumulation of cells in the pharyngo-faucial tissues, there should be something more than local anatomical peculiarities to explain it. Is it not a result of vaso-motor changes similar to those which prevail in the roseola and which are due to the impression of the syphilitic poison upon the central nervous system? The same condition, in all probability, prevails in other portions of the alimentary tract, which are, as is well known, intimately associated with the sympathetic nervous system. If is only at this point, however, that the parts affected are so superficial as to be open to observation. At this point, moreover, causes of irritation are more prevalent than in other portions of the alimentary tract. The food which is swallowed, rapid changes of temperature incidental to the function of respiration or to the ingestion of fluids at various temperatures; the use of the voice, the contact of irritating secretions from the nose and the inhalation of irritating substances from the atmosphere might quite rationally be expected to contribute to the tendency to localization of the syphilitic process in the throat.

In the presence of such local causes of irritation, vaso-motor disturbance incidental to the impression of the syphilitic poison upon the central nervous system might be determined at this point, while absent in every other situation.

As we have seen, the vaso-motor impression which underlies the development of the roseola is substituted later on for a more or less pronounced trophic disturbance, as manifested by the heaping up of neoplastic material, the development of pus, the occurrence of ulcerations, etc. *Pari passu* with the super-

vention of this trophic disturbance in the case of the skin we have a similar state of affairs in the pharynx and mucous membrane of the mouth, as manifested by the development of mucous patches, ulcers, and macular eruptions, the latter being particularly marked upon the roof of the mouth.

On careful observation of successive crops of lesions in syphilis, it will be found that the tendency to destruction of tissue and to the involvement of various important functions of the body grows more pronounced as the case progresses. We see, therefore, in watching a case from its inception, the gradual supervention of a trophic upon a vaso-motor disturbance, and as the case progresses this trophic aberration becomes more and more pronounced until finally in the period of the so-called sequelæ we have marked destruction of tissue in various situations—a destruction so marked as to have led to the impression at one time that the syphilitic poison produced in such instances corrosion of the tissues. In the absence of a corrosive power of the syphilitic poison —and as we know its infectious properties decrease as the case progresses—the only logical explanation of the serious effects of late syphilis is the theory of tropho-neurotic disturbance.

Let us glance at the series of morbid phenomena in a typical case, and the truth of the foregoing assertion is at once apparent:

First, we have a macular eruption or perhaps an efflorescence of the skin, which is not at all raised above the surface. This (the roseola) does not produce any destruction of tissue. Later on we have the development of papules; a little later in the natural order of succession, pustules, perhaps followed by ulceration. Still later we have marked ulceration of an echthymatous or perhaps rupial character; interspersed with these various later lesions or occurring alone, we may have a development of scaly lesions—sometimes tubercular syphilides. Coincidentally with the papules we have the appearance of sore throat, followed later on by mucous patches and perhaps ulceration. As the case progresses the bones may be affected; iritis may occur; well along in the period of sequelæ, necrosis of the bones may develop. It will be found that as the intensity of the infection

diminishes, the tendency to suppurative processes and to destruction of tissue increases. The later lesions are found to be frequently associated with disturbance of a known nervous character, cerebral syphilis in its various forms being quite apt to occur.

The exceptions to the gradual increment of severity of syphilitic lesions are so unusual that they are now designated as precocious. Malignant or precocious cases of syphilis are explicable in my opinion upon the theory of idiosyncrasy.

It is in the later secondary and sequelar lesions of the disease that the apparent tropho-neurotic character of the manifestations is most pronounced. I had long been impressed with the peculiar course of some of the osseous lesions of late syphilis, particularly those affecting the head and face. It had seemed to me that the destructive effects exerted by the morbid process upon the bony tissue, was greatly disproportionate to the objective and subjective phenomena which preceded the actual destruction.

For example, I think that upon reflection it will be found that the objective morbid phenomena which precede the necrosis *en masse* of various proportions of the palate, superior maxillary and nasal bones, are comparatively slight when we take into consideration the fact that the affected bone is entirely destroyed. Indeed, it often seems that the first objective phenomena perceptible in cases of necrosis of the parts mentioned, is incidental, not to destruction of the bone, but to an attempt on the part of nature to rid the tissues of offending foreign material. Thus I have observed cases in which the greater portion of the palate was entirely destroyed, yet very little manifestations of trouble were apparent until suppuration occurred with a small point of ulceration of the soft parts covering the bone and the discharge of a small quantity of pus—a quantity, by-the-way, so small as to be entirely disproportionate to the extent of the morbid process. On passing a probe into the small sinus thus formed, one who is not thoroughly conversant with the peculiarities of such conditions, would quite likely be surprised to find that a large portion of the bone is dead and perhaps loose in the tissues. It will be found upon observation of processes other than syphilitic, which produce necrosis or

caries of bone, that there exists prior to the death of the osseous structure, quite pronounced objective phenomena in the way of pain, swelling and deformity of the part, these symptoms indicating the existence of proliferated inflammatory material which subsequently produces, by simple pressure, destruction of the vitality of the bone. Those morbid phenomena in syphilis which involve bone or periosteum in the early part of the course of the disease are accompanied by relatively more prominent objective phenomena than those late lesions which are now under consideration ; yet, at the same time, they are rarely followed by caries or necrosis. These processes, it seems, are reserved for the late secondary or sequelar period of the disease. Thus it will be seen, that although the local process is apparently more severe in early cases, destruction of the vitality of the bone is not so likely to occur. There is a marked difference between the nodes and diffuse subperiosteal swellings of early syphilis, and the condition of the bone and periosteum, which precedes necrosis *en masse*, or for that matter, caries, in the late stages of the disease. In addition to the disproportion between the degree of destruction of bone and the objective phenomena preceding such destruction, another point worthy of comment, is the fact that syphilis possesses the power of dissecting out definite portions of osseous tissue, apparently by cutting off their nutritive supply in a manner as cleanly as it could be done by the knife. Thus I have specimens in my possession of the intermaxillary bone, portions of the alveolar process of the axilla, the malar and the ossæ nasi, which became necrosed, loosened and were removed from cases of late syphilis. These fragments of bone present as natural a conformation in many instances as in their healthy condition.

As far as I have been able to observe, there seems to be a special predilection in cases of late syphilis for those parts supplied by the fifth nerve, indicating that the portion of the sympathetic system which presides over these parts is particularly sensitive to the syphilitic impression.

I have found in some instances the tendency to unilateral destruction of osseous tissue particularly marked. Thus the palatal process of the superior

maxilla upon one side, or the superior alveolus on the other, may necrose and give way without the corresponding portion of bone becoming affected. Indeed, it seems that in most instances in which necrosis attacks the bones of the face, it is impossible to check the process until the line of demarkation represented by the anatomical outline of the affected bone has been reached.

The peculiar manner in which one-half of a structure may be dissected away by the sequelar lesions of syphilis, is exemplified by a case of syphiloma of the tongue which recently came under my observation in which the sloughing of the organ was limited to the raphe. This case subsequently went on to malignant transformation. I removed the tongue by the galvano-cautery, the disease recurred, and the patient died of hemorrhage several months later.*

I have had several cases recently in which that portion of the superior maxilla corresponding to the intermaxillary bone was dissected out by the syphilitic process with the resultant loss of the incisor teeth, the remainder of the jaw remaining intact. There appears to be a peculiar predilection of late syphilis for this portion of the jaw. I have seen several cases in which caries occurred in this situation with a consequent loss of one or more perfectly healthy teeth. These cases have appeared to me to be so characteristic that I have come to regard loss of the incisor teeth without any apparent cause as almost positive evidence of syphilis.

An interesting case illustrating the unilateral limitation of some late lesions of syphilis came under my observation recently.

The patient was a gentleman who had an obscure history of syphilis, dating some years back. Several weeks before coming under my observation, ulceration began at the roots of the molar teeth upon one side and extended outward to the palate. When I first saw the case the ulceration had extended outward upon the hard palate for about three-quarters of an inch and forward to the median line, when it abruptly stopped. The appearance of the ulceration was quite typical. There was no disease of the teeth or jaws to

* Apparent Cancerous Transformation of Syphiloma of the Tongue—Amputation by the Galvano-Cautery. *N. Y. Medical Record*, Oct. 26, 1889.

account for it. Healing was quite rapid under appropriate anti-syphilitic treatment.

Another interesting case of a somewhat similar character:

The patient was a gentleman who had syphilis seven or eight years ago. For the last three or four years he has had occasional symptoms of the disease. A few months since ulceration occurred about the roots of the upper incisor teeth and was attended with slight caries of the intermaxillary bone. The process was checked by appropriate treatment, the teeth, which were loosened, finally becoming perfectly solid. About six or eight weeks after the ulceration was healed the patient consulted me for supra and infra-orbital neuralgia and hemicrania. This resisted all treatment except anti-syphilitic remedies. It yielded readily to iodide of potassium in large doses. Within a few days the patient has again consulted me for paræsthesia of the right side of the face, which he noticed for the first time while being shaved. His face having been excessively tender previously, he very speedily noticed a lack of sensibility under the razor. Associated with this paræsthesia there is obscure pain which he locates back of the eyeball. The *ensemble* of symptoms in this case points to central disturbance and evidence a manifest predilection of the sequelar lesion for the fifth cranial nerve.

The association of obstinate tubercular syphilides with nervous syphilis is well known. It seems that the danger of involvement of the central nervous system is directly proportionate to that of severe syphilides.

In considering the tropho-neurotic character of the late lesions of syphilis, I do not ignore the fact that syphilis may act directly upon the nervous system in several different ways:

1. By the direct effect of syphilitic deposit upon the nerve cells or fibers, or membranes of the brain and spinal cord.

2. By changes in the membranous envelopes of the brain and spinal cord.

3. By deposits in and about the blood vessels which induce circulatory disturbance.

4. By a proliferation and condensation of connective tissue which remains after the syphilitic material *per se* has been removed.

There is probably a difference in the late and early forms of syphilitic lesions in the manner in which the tropho-neurotic element is brought about. Thus it may be due in the *first* place, to a direct impression of the syphilitic poison upon the sympathetic nervous system. *Secondly*, upon direct pressure upon the nervous structures. *Thirdly*, upon a disturbance of function and nutrition of the nervous structures incidental to interference with blood supply.

It is probable that mercury acts upon the nervous system in very much the same manner as does syphilis. It is very difficult to differentiate late syphilitic lesions of the bones and of the mucous membranes from those directly due to the action of mercury. That mercury exerts a powerful effect upon the sympathetic nervous system is, it seems to me, shown conclusively by the phenomena of ptyalism, which cannot be accounted for solely upon the theory of the production of irritation. The well-known power of mercury over the secretions is probably due to its influence upon the sympathetic ganglia. When the injurious action of mercury is superadded to syphilis, there is a more marked tendency to tropho-neurotic phenomena than in well-treated cases of the disease. Indeed, the excessive use of mercury often seems to determine the predilection of late syphilis for the bones of the head and face. It is quite as capable of producing necrosis or destructive ulceration of these parts, as is syphilis *per se*.

Positive demonstration of the dependence of the phenomena which I have outlined upon nervous disturbance, is of course difficult, but the inferences which I have drawn appear to me to be logical. In considering the question of trophic disturbances in their relation to destructive syphilitic processes it is well to remember the familiar physiological experiment of section of the sympathetic in the neck of the rabbit. The same experiment is also interesting as bearing upon the faucial congestion of early syphilis. The reddening of the ear of the rabbit, the inflammation and sloughing of the cornea incidental to section of the sympathetic are certainly suggestive. To carry the analogy of this physiological demonstration a little further, I would call attention to the serious corneal trouble which sometimes results from herpes frontalis *seu* orbicularis.

A REVIEW OF

VARICOCELE AND ITS TREATMENT.*

Varicocele in a general way, may be said to be one of the most frequent surgical diseases of the male genito-urinary apparatus. If however we take into consideration only those instances in which the disease is sufficiently marked to demand the attention of the surgeon, the number of cases is greatly reduced. Varicocele is not an intrinsically serious affection, but from certain circumstances peculiar to its location and the importance of the function of the involved part, there is nevertheless a fair proportion of cases in which the patient sooner or later consults the surgeon. There are few diseases of so mild a character *per se* that are capable of causing so much annoyance to the patient as is varicocele.

To be sure the annoyance is more often of a mental than physical character, but to my mind this very fact is a warrant for more careful consideration than is usually accorded it. It is not every patient whom we can convince that the condition is a very trifling matter.

In some cases there are urgent physical reasons for most careful consideration of the disease.

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*Read in abstract before the Southern Surgical and Gynæcological Association. Atlanta, Ga., Nov. 12, 1890.

Varicocele consists of a dilatation of, with accompanying structural changes in, the walls of the plexus of veins surrounding the spermatic cord. These changes are the same as those which occur in varix in other situations; the causes being also essentially the same if we exclude masturbation and sexual excesses.

The term varicocele is not very definite, inasmuch as it literally implies a varicose enlargement of the veins in any situation. Etymologically, the inaccuracy of the nomenclature of the special form of varicocity under consideration, is quite evident.

The word varicocele (fr. varix=a dilated vein+*κηλη* =a tumor) is an awkward but convenient hybrid. Cirsocole (incorrectly circocele *κιρσος*=a varix+*κηλη* a tumor), is more elegant and perhaps more correct, but is almost obsolete. Both words from an etymological standpoint signify a varicose swelling in any portion of the body, but clinical usage has restricted them to the scrotal region. Pott suggested the term cirsocele for varicose veins in the scrotum, and varicocele for a similar condition of the veins of the spermatic cord, but at the present day the former term is rarely met with in English medical works or periodicals.

The frequency of varicocele is a matter of some doubt, statistics varying greatly. The wide variation in estimates is doubtless due to the varying interpretation of the term *varicocele* by different observers, and to the varying classes among whom the observations are made. Landouzy, an old French writer, put the proportion of cases at 60 per cent of adult males.

This is undoubtedly an exaggeration due to the classification of the slighter forms of dilatation of the spermatic veins as varicocele.

Henry found but forty-one cases in nearly two thousand men examined for the New York police

*"Du varicocèle et en particulier de la cure radicale de cette affection."

force*. This record is however not an accurate criterion of the frequency of varicocele, as applicants for the metropolitan police force are exceptionally vigorous, and by no means the class predisposed to the disease. My own observations, comprising a large number of life insurance examinations, as well as a large number of patients seen in private and dispensary practice, show that not to exceed 5 per cent of male adults have varicocele, of even moderate dimensions. The proportion of cases which are marked enough to cause definite symptoms is even smaller.

Varicocele often tends to diminish with advancing age. M. Horteloup, surgeon to the Bicétre† found 42 subjects with varicocele among 1,600 individuals, and of these 16 had developed before the age of twenty-five. Of the total number of cases 14 increased, 19 remained stationary, 8 diminished and one entirely disappeared at the age of 45. Of the cases which appeared before the age of 25, eleven increased or remained stationary, four diminished and one disappeared. These figures show that while varicocele does not necessarily progress, an increase is to be anticipated in a fair proportion of cases. The prognosis is rendered more favorable, however, if we consider the class of patients on whom these observations were made. The occupants and out patients of the Bicetré are nearly all engaged in hard manual labor. As Horteloup remarks in connection with the indications for treatment; the surgeon must be guided in his practice by the social status of the patient. Palliation may effectually prevent increase of the varicocle in the wealthier class of patients, yet prove ineffectual among laborers and those subjected to prolonged standing. Vidal has laid especial stress upon this point:

Varicocele is more frequent than varices elsewhere from the fact that there exists not only general but

*"The treatment of varicocele," 1889.

†Memoire á l'Acad. inedit.

also special causes of venous dilation due to local anatomical conditions. The veins are relatively large, and follow a devious course along the spermatic cord, forming a peculiar plexus (pampiniform) about this structure; the vessels of this plexus frequently anastomose. The valves of these vessels are few in number, very defective and yield to the downward pressure of injected fluid very readily. As compared with the veins in other locations those of the pampiniform plexus are poorly supported by connective tissue which is in this situation sparse, loose and inelastic. The spermatic veins are very long and independently of defective valves, there is a marked tendency to yielding of the illy-supported venous walls, to the weight of the long column of blood which flows so nearly perpendicularly upward. Pressure upon the veins as they traverse the inguinal canal tends to enhance the prospect of varicocele. Strains of the abdominal wall and especially those involved in difficult defecation are likely to bring this about.

Varicocele has been a subject of some importance to military surgeons, especially as regards examinations for enlistment. Landouzy states that of 166,317 men examined in England and Ireland during a series of years, 70.5 per cent were exempted from service on account of varicocele. The Army Medical Reports of Great Britain are quoted as stating that during the years from 1869 to 1873, of 331,568 men examined, 5,312 were rejected for varicocele. Sistach, in 1863, asserted that in France, 11 per 1,000 of candidates were rejected for varicocele. From 1879 to 1883 the proportion had been reduced to 3 per 1000. It is claimed that this reduction was due to improved methods of treatment, but this is probably an exaggerated estimate of surgical progress. Horteloup relates a case that was rejected on account of varicocele, in which the candidate was accepted without comment after a successful operation.

Varicocele is most frequent upon the left side, the reasons advanced therefor being: 1.—The relative-

ly lower position of the left testis. 2.—The relative acuteness of the angle formed by the junction of the left spermatic with the renal vein. 3.—The close proximity of the left spermatic vein to the sigmoid flexure of the colon and its consequent exposure to pressure in constipation. 4.—The absence of a valve in the left spermatic vein at its junction with the renal. 5.—The tendency of men to stand upon the left foot.

It would appear that the relatively greater length of the cord and its attendant vascular structures with the consequent greater weight of the contained column of blood upon the left as compared with the right side, is an all-sufficient explanation.

When varicocele is present on the right side there is almost invariably involvement of the left side also; —indeed, I do not recall a case in which the right side alone was involved. Traumatic causes may, however, give rise to such a condition. The relatively greater frequency of varicocele on the left side was expatiated upon by Celsus, hence there has been plenty of time for an abundant crop of explanations to develop.

The causes of varicocele are several: First and most important is a constitutional lack of tone—this cause is rarely accorded sufficient importance, the tendeney being to seek for exclusively local causes. What is termed congenital or hereditary predisposition to varixin general, consists of an inherent lack of muscular and vascular tonicity. The venous walls are especially weak and flabby, and the circulation sluggish. The same causes that produce laxity of the venous walls produce feeble heart action; there is a deficiency in the *vis a tergo* which is so important in propelling the blood through the veins, and also a deficiency in the aspirating power of the heart and lungs. The association of these conditions with varices of the extremities will on reflection be found to be very familiar. These same patients present a special tendency to hemorrhages on account of vaso motor

deficiency, and I have noticed in a general way that the existence of varices of the extremities in patients about to be operated upon, is a note of warning as regards possible annoyance from hemorrhage.

Persons who suffer from such diseases as purpura and scurvy are peculiarly liable to relaxed and dilated conditions of the veins. Strumous individuals also present a tendency to varices.

Varices are apt to occur in persons of indolent habits, because of defective circulation as well as a general lack of tone with resulting vascular flabbiness incidental to insufficient exercise. Such persons, who are compelled to stand at their work for prolonged periods are peculiarly subject to varicose veins. Certain diseases of the heart, liver, lungs, and peritoneal cavity, which produce by pressure, retardation of the return flow through the inferior vena cava and iliac veins, favor the development of varix. Long standing portal obstruction is liable to produce varicocele in conjunction with hemorrhoids.

Masturbation, sexual excesses and prolonged venereal excitement without gratification are undoubtedly responsible for varicocele in many instances. I regard it as highly improbable that these causes if brought to play for the first time in a healthy adult, would cause varicocele, but occurring as they usually do when tissue development is really in excess as compared with the inherent resisting power of the various structures, they operate very powerfully in producing congestion and finally dilatation of the spermatic plexus. It will be found that in a large proportion of cases which seem to be attributable to these causes there exists a foundation for the disease in the form of an inherently defective tone of the vascular walls, akin perhaps to that mysterious condition which exists in hæmophilia as far as its hereditary character is concerned.

Inasmuch as it is an established fact that this disease is of an hereditary character and to a great extent dependent upon defective arterial contractility,

it is fair to assume that a similarly defective tone of the venous walls may exist. A case has recently come under my observation which illustrates in a forcible manner the association of perverted vascular tone and blood quality with varicocele. An epileptic was referred to me by Dr. S. V. Clevinger for consultation. This man had a very large varicocele which annoyed him greatly, the chief complaint being that the profuse perspiration which bathed the part was almost constantly of a sanguineous character. The patient informed me that his seminal ejaculations were always heavily tinged with blood.

My friend Dr. F. W. McRae, of Atlanta, Ga., has described a similar case to me, in which the scrotal hæmidrosis was quite distinct. These cases are the only examples of this peculiar condition which have come under my observation. As an illustration of the fact that vaso motor aberration existed in my case, I will state that I operated upon the patient for stricture and had a very alarming hemorrhage to deal with, which persisted for several days. From what has been said it is evident that varicocele is usually met with in comparatively feeble subjects. Occasionally from some special cause involving trauma, robust individuals are affected by it. Spencer has advanced the novel theory that varicocele is due to the persistence of fœtal veins which ordinarily undergo complete involution during childhood.

Varicocele has been known to occur from heavy lifting and athletic strain of various kinds. I have seen several cases which were probably of this origin. Keyes describes this variety: Years ago, Percival Pott described what he termed "acute varicocele" due to a combination of fatigue, injury to the part and exposure to cold, the condition being followed by complete atrophy of the testis. These cases were probably phlebitis of the spermatic plexus which was followed by complete occlusion of their lumen. Orchitis was possibly an attendant condition.

Excessive horseback riding is a fertile source of

varicocele—an occasional blow from the pommel of the saddle being a secondary but by no means unimportant consideration. Varicocele from this cause is especially apt to be associated with hemorrhoids. The records of the pension office are very interesting in this connection.

Chronic constipation is regarded by many surgeons as a very fertile source of varicocele; this I accept, providing the constitutional defect already described be associated with it. Constipation alone, I believe to be insufficient to produce varicocele. The pressure of accumulated fæces upon the left spermatic vein tends to retard the return circulation, and if the venous walls be naturally defective, varicocele may result. The pressure of a truss sometimes produces varicocele in conjunction with a hernia; indeed, the pressure of a hernia itself has been alleged to cause varicocele. This is worthy of note, inasmuch as the application of a truss for the cure of varicocele is recommended by several excellent authorities, as will be seen later. It is to be remembered in connection with the etiology of varicocele that constitutional debility may bear the relation to the disease of both cause and effect.

Varicocele occurs with the greatest frequency between the ages of fifteen and thirty-five, this being the period when all the faculties of the body are at their maximum and physical growth is most active; or better, this is the period when there is a degree of growth far in excess of the inherent strength of tissue.

It is at this period also, that perverted sexual habits and hygiene are apt to enter into the daily life of the patient, either in the form of sexual excess, sexual excitement without gratification, or most frequently, masturbation. It is at this age that men are most likely to overtax their strength; then too the effects of exhaustion are most severe, especially near the period of puberty. Varicocele is occasionally met with in young children, and in such cases there is not

only a pronounced atonicity of vascular structure in general, but evidences of sexual precocity. In certain rare instances it has been known to occur after middle life, in which event there is a decidedly disproportionate varicocity of the scrotal veins.

The morbid anatomy of varicocele comprises few changes of importance. The pathological changes consist mainly in dilatation and tortuosity of the veins with a coincident loss of elasticity and contractility. There is usually more or less increase in the thickness of the venous walls. This, however, does not make the vessels proportionately stronger because of the fact that the vessels are enormously dilated, and their walls are consequently much thinner in proportion to the bulk and weight of the contained blood than is the case with normal vessels. Not only are the elastic and contractile elements of the vascular walls absorbed in pronounced varicocele, but they are replaced by a low grade of connective or fibro-connective tissue. These conditions enhance the structural weakness. Subacute or chronic inflammatory changes may occur and cause primarily still further thickening, and secondarily a more pronounced degree of degeneration of the vessels. As a consequence of these conditions of innutrition, areas of fatty degeneration may develop.

These degenerated areas explain the occasional occurrence of hæmatocele of the scrotum from slight exciting causes in pronounced varicocele. Acute phlebitis may attack varicocele and prove a serious matter. Vidal de Cassis reported two cases of this kind, one due to a kick and the other to propagation of inflammation from an acute epidymitis. *Plaques* of calcific deposit may be observed in some cases and phleboliths are by no means rare; oftentimes these concretions may be felt from the exterior. The valves of the involved veins are a dead letter as far as their functionating capacity is concerned; so degenerated do they become that they present the appearance of rudimentary valves in other situations.

The testicle of the affected side rarely retains its

structural integrity; but becomes softer than normal, shrunken and atrophied; in severe cases it may be difficult to detect amidst the worm like mass of veins. There is of course no method of determining its functional power with any degree of accuracy, excepting where the opposite testicle is out of service, but the physical condition of the organ is a very fair criterion of its physiological activity. The cutaneous, muscular and serous envelopes of the testis participate in the general and local lack of tone, and the veins of the organ proper become dilated and varicose. The scrotum is lax, thinned and pendulous and on section the fibres of the dartos muscle will be found to be sparse and fragile. Elastic tissue is also much scantier than normal.

In general, the cutaneous structure proper is thinner and more distensible than in its normal condition. The scrotal veins are dilated, tortuous and thinned, their varicocity in some cases being quite remarkable. This condition of the veins is an additional evidence of the general lack of vascular tonicity.

Verneuil describes two cases of erectile venous tumors of the scrotum associated with varicocele, which showed a marked tendency to spontaneous inflammation. Escallier reported two similar cases which spontaneously underwent suppuration, with a fatal result. In most cases the anterior spermatic plexus is alone involved primarily, the posterior plexus however, becoming involved later in many cases. Sometimes it only is involved.

The Symptoms of varicocele are in the main so familiar that their description is only necessary for completeness. They necessarily vary according to the severity of the varix. The first thing to attract the attention of the patient is usually enlargement of the veins, producing as the patient erroneously supposes, a slightly tumorous condition of the testicle. This enlargement is in many cases so slight that it is of no practical importance, and should hardly be designated as a varicocele; its principal effect in such cases being a greater or less disturbance of the *morale*

of the patient. Those individuals who consult the surgeon regarding the slighter forms of varicocele are usually masturbators who have become aware of the possible evil effects of the practice and who, under the stimulus of quack literature are practicing a most rigid introspection and frantically searching for morbid effects of their vicious habits. In their daily inspection of the genitals these patients discover a slight enlargement of one or the other testicle. Possibly at this time their attention is first called to the fact that one testicle hangs lower than the other. The discovery of this condition in combination with guilty self-consciousness impels the patient to seek relief; only too often he consults the quack, who finds in such patients his richest harvest. Should pollutions or spermatorrhœa be present, then indeed is the quack in clover.

These slight enlargements of the spermatic veins are due to imperfect sexual hygiene with attendant venous congestion and should be called spermatic congestion, rather than dignified by the term varicocele They generally disappear after normal sexual relations have been established, and it is rare for such patients to consult the surgeon after they have once been happily married. Operative interference in these cases is usually unwarrantable. Even in these slight cases, however, there may be neuralgic symptoms of sufficient severity to warrant treatment, both general and local.

Varicocele in its more marked form is readily recognizable. It presents a soft, mushy tumor, which is ordinarily said to resemble a bunch of earth-worms in a sac. This description is very accurate, as every surgeon knows. The veins of the scrotum are very often tortuous and dilated. Varicocele is not supposed to be tender on pressure, but if phlebitis exists or there is severe neuralgia of the testicle and cord, the part is apt to be extremely hyperæsthetic. In the majority of advanced cases the testicle is not only atrophied, but is extremely insensitive to touch or even pressure. Phleboliths may be detected within

the veins and may perhaps be the centers of inflammatory changes and consequent tenderness.

The subjective symptoms of varicocele vary greatly; this is especially true of those of a mental character. A case of moderate varicocele in which the mind of the patient has not been disturbed by quack literature or the rigid introspection induced by a knowledge of the evils of masturbation is apt to cause little or no inconvenience. In nearly all well marked cases, however, the conditions are decidedly unfavorable to mental composure and a greater or less degree of physical suffering is almost inevitable. The testicle is an extremely sensitive organ and its nervous supply is so closely associated with the great sympathetic system that diseases affecting its structure might rationally be expected to produce general nervous disturbance as well as pronounced local symptoms. The painful and depressing character of orchitis and epididymitis is sufficient to show that disturbances of the testicle are productive of a disproportionate degree of general disturbance. This is characteristic of all diseases of the sexual apparatus—we all know what serious symptoms may follow a phimosed prepuce or a contracted meatus. If these slight affections produce such affects, how much more likely is varicocele to cause great annoyance from the constant dragging upon so sensitive a structure as the spermatic cord and the incidental congestion of a still more sensitive testicle. I speak of these points more particularly because most surgeons are inclined to believe that all of the symptoms described by the subjects of varicocele, are imaginary. This belief is hardly consistent with our physiological and anatomical knowledge, yet it prevails even among those who would sacrifice an ovary upon the slightest pretext. It might be a good plan for the practitioner to learn more of the reflex and other phenomena dependent upon morbid conditions of the male sexual apparatus, the more especially as the consideration of a method of treatment similar to that advocated indiscrimin-

ately in certain quarters, for the female, would save a few bushels of ovaries and appendages. It is safe to say moreover, that not a testicle would be lost.

In the majority of cases of pronounced varicocele a greater or less degree of mental depression and sexual hypochondriasis exists, and in certain instances serve to make life miserable. Vidal has called attention to the fact that suicidal impulses are occasionally observed in the subjects of varicocele. He notes the case of a hospital physician who told him that he had decided to blow his brains out in case he could not be promised a cure. If the tumor be very large and the patient sensitive the physical deformity may cause great annoyance. This was most marked in one of my cases.

Whether as a coincidental effect of a similiar cause or as an effect of the varicocele *per se*, there exists in nearly every case of severe varicocele a decided loss of tone of the sexual apparatus. The symptoms indicative of this are in my estimation often directly dependent upon the varicocele. Pseudo impotence, frequent pollutions and spermatorrhœa are often met with and may persist in spite of treatment until the varicocele has been operated upon. Irritability of the vesical neck, vesical hyperæsthesia or neuralgia—neuralgia of the testes and cord, a painful sense of dragging and weight along the cord, penile or urethral neuralgia, pain in the back and crural neuralgia are quite constant symptoms, the pain in the back being usually the most marked. When the varicocele is very large, the scrotum extremely lax and pendulous and its veins greatly dilated and tortuous, considerable mechanical discomfort may be experienced; as one of my patients expressed it, the tumor "flopped against his legs like a cow's bag." Should the sudoriferous secretion from the relaxed scrotum be excessive, pruritus, intertrigo and often intractable eczema may result. I have a patient at the present time who has a most obstinate and almost intolerable eczema due to a very large varicocele. The ordinary remedies having proven ineffectual, but as the patient has

no appetite for surgical operations my sympathies are necessarily reduced to a minimum. The cutaneous irritation incidental to varicocele was long ago mentioned by Landouzy as an indication for operation as he expressed it, "the continual moisture sometimes produces a perfectly unbearable irritation of the skin." The dermatitis incidental to varicocele is obviously due in some measure to friction which is unavoidable.

Wickham calls attention to violent gastralgia (?) chlorosis and marked malnutrition as results of varicocele.

In recounting the symptoms incidental to large varicoceles I do not wish to appear dogmatic, as the pain and other uncomfortable symptoms are not necessarily proportionate to the severity of the disease. In some cases of slight varicocele the patient is profoundly depressed and complains greatly of reflex pains in the back, thighs and testes with associated marked hypochondriasis. In other cases a large varicocele may produce no discomfort whatever, save that which is incidental to its size and the consequent mechanical inconvenience; consisting chiefly in impeded locomotion. Much depends on the sexual hygiene of the patient. If this be normal, his symptoms are apt to be comparatively slight. The relief of congestion incidental to sexual congress, was long ago noted as beneficial to varicocele.* Wickham, however reports a case in which all the symptoms were aggravated for some days, by each act of coition.†

An important point in the consideration of varicocele is *the danger of scrotal hæmatocele.* The friable, degenerated vessels are liable to rupture under falls, blows or strains. One case of hæmatocele from injury of a varicocele, has come under my own observation. Vidal reported two cases of this kind. That the diseased veins may rupture spontaneously has been asserted, but I regard this accident as highly improbable, although perhaps not impossible. Escallier's

* Landouzy op. cit.
† These de Paris.

cases of spontaneous (?) phlebitis already quoted are important in this connection.

Atrophy of the testicle, already alluded to, is an inevitable result sooner or later, in severe varicocele. This is an important consideration, as the sound testicle may become diseased independently of the varix, and lose its functional power. This I regard as one of the prime indications for surgical interference in large varicoceles.

That varicocele affects the structural integrity of the testes has been observed by such writers as Curling, Cooper, Barwell, Pott and Humphrey. Numerous French writers, notably Gosselin and Wickham, have asserted that the function of the testicle is impaired. One of Gosselin's observations is very striking. In a case of marked varicocele on the left side, the patient developed an epididymitis in the opposite testicle. Microscopical examination of the semen showed the complete absence of spermatozoa. This point is well worthy of serious consideration, for under certain circumstances an operation, producing as it does, improvement in the nutrition and function of the testes, would be warranted by this indication alone.

There is one practical point which, so far as I know, has not been noted by surgical authorities: I refer to the predisposition to hernia existing in the subjects of varicocele. I have observed several cases in which hernia followed a slight strain in adults who had long been affected by varicocele. It is admitted that the same constitutional weakness and local structural imperfection that predisposes to varicocele favors the occurrence of hernia, but it has seemed to me that the varicocele *per se* had a direct mechanical influence in favoring the escape of the abdominal contents. The continual dragging of the varicocele upon the structures traversing the inguinal rings and canal must necessarily enlarge these structures and thus weaken the abdominal walls at this point. The relaxed condition of the scrotal tissues is also a favoring element in the causation of hernia. The

hernia is obviously most apt to occur upon the side of the varicocele, but in some instances the opposite side is affected. Here the causal influence of the varix *per se* is not easily demonstrable, but scrotal relaxation and dragging doubtless have some effect.

The treatment of Varicocele has called forth the ingenuity of surgeons in many ways and it is my desire to present as clearly and briefly as possible the numerous methods that have been suggested by various authorities.

The treatment of varicocele in its milder forms is altogether palliative—in fact in a large proportion of cases it is only necessary to allay the patient's mental annoyance by a little sound physiological advice. Instruction in sexual physiology and hygiene is necessary in all cases to keep the patient out of the clutches of the quack on the one hand and to assist in a cure on the other. The slighter grades of varix will be found to disappear on the removal of the inducing conditions. Such cases should really be termed spermatic congestion—they disappear on removal of constipation and regulation of the sexual habits. Marriage, if practicable, is the best remedy. All authorities unite upon the importance of attention to the bowels. Should the patient experience a dread of impotence, some pains should be taken to correct his morbid impression, else the prospect of matrimony is apt to be distasteful to him. In all cases, whether marked or slight, due attention should be given to measures tending to restore constitutional tone. Exercise short of fatigue, proper hours of rest, avoidance of sexual excess and the use of the shower bath are essential. Regulation of the diet and temperate habits do much to assist in a cure. In recommending exercise the patient should be warned against violent strains as tending to increase the varix and favoring hernia and hæmatocele.

If varicocele be associated with frequent pollutions or spermatorrhœa, it may be necessary to adopt some of the various measures of treatment for these conditions. If there be hypochondriasis or neuralgic

symptoms it is advisable to pass a cold sound occasionally. The results of this simple measure are often remarkable, the morale of the patient being improved to a wonderful extent. This effect is due primarily to the peculiarly stimulating effect of distension of the urethra, upon the central sympathetic system as well as to a certain moral effect. The latter effect is usually accorded too much importance, and the physiological effect incidental to the stimulation by stretching of such regions as the urethra, cervix uteri, anus and rectum is forgotten. The application of astringent ointments or suppositories to the prostate is often of great benefit.

In the correction of constipation, mild laxatives and not drastic purgatives should be given. Remedies which tend to relieve hepatic congestion or torpor are always in order. Theoretical considerations aside, there is no better remedy than minute doses of calomel. The tablet triturates of Caswell, Hazard, & Co. in doses of $\frac{1}{10}$ to $\frac{1}{5}$ gr. at bedtime are a favorite with me. One who has never used them will be convinced by their action that he has a great deal to learn regarding the use of this much abused drug. Of the various tonics, non-constipating preparations of iron, strychnia and the mineral acids are serviceable. A very satisfactory tonic is the new preparation of "the three chlorides" manufactured by Renz & Henry, of Louisville. I began using this preparation at the suggestion of Dr. J. R. Larrabee, and it deserves all that he says of it.

Remedies which are supposed to act directly upon the vascular walls have been highly recommended in varicocele. Agnew endorses ergot very highly. As far as diseases affecting the veins are concerned I have more faith in hamamelis than in ergot, but neither of these drugs is apt to produce much benefit in varicocele - this is readily understood on dissection of the flabby degenerated mass of veins composing the varix.

The application of cold to the part is a time-honored remedy in varicocele; douching the scrotum with

cold salt water is an excellent adjuvant to other measures in all cases, but in the severe forms it is not likely to accomplish much. The addition of astringent drugs to the water used for bathing the parts is endorsed by high authority. Such a measure is a little absurd to say the least. Mechanical measures are sometimes employed for the purpose of exciting contraction of the dartos muscle in the hope of thereby impressing the varicocele. Flagellation for fifteen or twenty minutes with a wet towel or with rubber tubing has been recommended.

Support of the part by some mechanical device is the most familiar method of treatment of varicocele. A simple but troublesome method is that of the application of adhesive plaster (Morgan's method). The affected side is encircled with strips of stout plaster while the scrotum is elevated. A loop of plaster is now applied vertically over the encircling strips and through this loop a piece of bandage is passed, its ends being attached to a waistband. The varicocele is thus elevated and theoretically drained of blood. The angle produced in the efferent veins, however, nullifies the possible benefits of the method.

The suspensory bandage is an every day method of treatment, but after all it is on the average carelessly selected and still more carelessly used. Most of the flimsy devices for suspending the testes, are worse than useless. A suspensory should fit accurately and should keep the parts well up. The surgeon should not leave this to the appliance dealer, but should attend to it himself. A suspensory should be light, firm and easily adjusted. Silk and rubber tissue are too heating and not very durable, they are also quite expensive if well made. The U. S. Army suspensory known as Rawson's is superior to all others in the market. Morgan's suspensory is highly endorsed. This is laced in front. The tumor being lifted and drained of blood is placed in the bag and the laces carefully adjusted. A form of suspensory has been recommended which is to be elevated and fastened to a waistband by a strap and buckle as described in the

application of adhesive strips. To this, the same objections may be urged as in the case of the plaster.

Infibulation of the scrotum has been recommended. The best appliance for this purpose is the soft silver ring devised by Wormald. This ring is covered with soft leather or rubber. The varicocele is emptied of blood and the scrotum drawn through the ring, which is then compressed to a degree just sufficient to prevent the veins from refilling. The principal objection to this appliance is the irritation and occasional ulceration of the scrotum which it is apt to induce. Few patients will tolerate it. Curling reports a case of Coulson's in which this appliance caused sloughing of the scrotum.*

Pressure upon the spermatic veins at the external abdominal ring has been recommended, the object being "to direct the blood back into other and smaller channels than the spermatic veins.†" Various trusses have been devised for this purpose. Stephen Smith asserts that this method will cure severe forms of varicocele.‡ Gant states that a truss sometimes cures, but that sometimes the veins have enlarged as a consequence of the method.§ A truss is not only difficult to adjust with the proper degree of pressure but defeats the object for which it is intended. The pressure enhances the already existing spermatic congestion, never completely shuts off the backflow of venous blood and affords absolutely no support to the weakened and dilated vascular walls. It is but just to state however that Curling and later Ravoth endorse the truss treatment.

Electricity has its advocates in the treatment of varicocele. Beyond a certain amount of circulatory stimulation induced by the faradic current, I consider electricity absolutely worthless. Electrolysis has been suggested but I should consider it not only

*Diseases of Testis, 4th Ed.
†Agnew. Surgery, vol. II. p. 565.
‡Op. of Surg. p. 273.
§Surgery p. 1081.

worthless but possibly dangerous. Further experience with the method may however prove its value and safety.

Of all the methods of treatment which have been suggested, that by hypodermatic injection with various chemicals appears to me to be the most painful, worthless, illogical and dangerous. I have done very little experimenting in this direction and I have found that either the patient or myself was very glad to quit in every instance.

Ergotine,* solution of persulphate of iron, carbolic acid† and hydrate of chloral have each had their advocates and their trains of disgruntled patients. Even poor old alcohol has been appealed to for a cure, a Russian with the euphonious cognomen of Duhonovsky being the guilty party.‡

The possible dangers of the injection method are obvious: Cellulitis, sloughing, orchitis, tetanus, phlebitis and septic infection are all within the range of possibilities.

Bonnet, Philippeaux and Rigaud used Vienna paste and chloride of zinc to the scrotum to produce a radical cure, and obtained some good results.

It is not necessary to comment upon this method of aforetime.

The various palliative measures which have been suggested are usually sufficient to relieve the symptoms and prevent an increase in the size of the varix in cases of moderate severity. In the more severe cases, however, the characteristic changes in the vascular walls, due mainly to a loss of tone and connective tissue proliferation, go on and we have an increase in size of the varix with consequent aggravation of the symptoms. In the more marked cases the physical deformity is apt to be considerable and may occasion great annoyance. Some men, however, are not hypersensitive, judging by the exhibitions which one may often observe on the street cars.

*Bartarelli and Citaglia. Ashhurst 1077.
†Leonard Weber.
‡Ashhurst. 1077.

During the seasons when tight pantaloons are in fashion, Comstock should be kept busy. In large varicoceles the suspensory bandage fails to prevent noticeable deformity and the consequent failure to relieve the mental symptoms is especially pronounced. In adjusting his bandage the owner of a varicocele is made painfully cognizant of his deformity. The knowledge that he is unlike other young men as regards his sexual apparatus is apt to have a peculiarly demoralizing effect. The various symptoms of a subjective character that have already been enumerated demand relief of a more substantial character than palliative measures afford. If impotency exist, the matter is of urgent importance, especially where perpetuation of family is of moment.

I do not wish to be recorded as advising indiscriminate operation in varicocele, but I do claim that a certain proportion of cases demand operation. I think moreover, that this proportion is larger than is usually believed. The dogma of infallibility, which surrounds the teachings of the surgical authorities of the past with a halo of intolerance, has so far infected the practice of the modern surgeon that he usually discountenances any and all operative measures in varicocele—which in his eyes at least is a surgical *noli me tangere*. Van Buren was strongly opposed to all operative methods in varicocele, and his teachings have done much to prevent surgical interference in these cases. It is a common experience for the surgeon who is willing to operate in suitable cases, to be criticised by the majority of his brethren to whose attention the particular case chances to be brought. Most of the criticism comes from men who not only have never performed an operation for varicocele, but probable have never seen one performed. As conservative a surgeon as Segond, who claimed that in the majority of cases operation was unnecessary, said that "operation is certainly pardonable when the inconveniences of the condition are greater than the dangers of intervention."

Having acknowledged that the majority of cases of

varicocele may be satisfactorily temporized with, it is certainly not overbold for one to advocate operative measures in some of the severe cases that come under our care, the more especially as operation nearly always relieves the pain which so frequently exists. If moreover, a method of operating be practicable that is perfectly safe, there can be no objection to operation even in cases of moderate severity. As Wickham remarks, "the facts prove that large varicoceles may lead to serious consequences, such as hæmatocele and phlebitis, spontaneous or traumatic." This point is worthy of attention in considering the justification of an operation.

The indications for operation in varicocele may be formulated as follows:

1. When the varicocele is very voluminous and a cause of marked deformity.
2. When the varicocele is very painful, or is the cause of reflex neuralgia of a severe type.
3. When aberration of the sexual function exists.
4. When irritation of the scrotum is marked and obstinate.
5. When the varicocele interferes with the occupation.
6. When the affected testicle is atrophying.
7. When the opposite testis is diseased.
8. When symptoms of mental aberration are pronounced.
9. When the varix is an obstacle to entering public service—military, naval or civil.

An operation having been decided upon it remains for us to select the method. Before advocating any particular operation I will endeavor to present briefly and fairly the principal operations which have been recommended. The operations by castration, resection of the vas deferens and ligature of the spermatic arteries are unworthy of notice.

One of the earliest operations was that of Vidal de Cassis.* This method consists in passing an iron pin

*De la cure radicale du varicocele par l'enroulement, etc., 1850.

through the scrotum between the vas deferens and the enlarged veins. A silver wire is then passed along the pin outside the veins which are thus included between the pin and the wire. The wire is now fastened to the ends of the pin and the latter twisted so as to bring a certain amount of pressure to bear upon the vessels (*enroulement*). The twisting process is repeated every day or two until the veins ulcerate through and the pin becomes loose; pin and wire are then withdrawn. The veins are thus cut across and obliterated by inflammatory adhesions. This is the principle involved in all methods of deligation in varicocele. Bradley modifies Vidal's operation by using a second pin instead of a wire, thus obliterating the veins by acupressure. Markoe modifies it by dispensing with the pin and using a loop of silver wire clamped to a lead plate. The wire is gradually tightened.

Ricord's method is practically the parent of the methods of subcutaneous deligation. Two double ligatures introduced through a single opening through the scrotum. One double ligature passes above the veins (between the veins and the vas deferens) and the other below them. The loop of one ligature and the two ends of the other project at each opening. The free ends are now threaded through the corresponding loops and made fast to a small yoke provided with a screw. This is tightened from day to day and the loops thus drawn into the scrotum so as to eventually strangulate and cut through the enlarged veins. The ligatures come away in the second or third week.

Wood's modification of the Ricord operation consists in the application of a single subcutaneous ligature of annealed iron wire. The ends of the loop are fastened to a light steel spring, the constant tension of which cuts off the veins. A piece of adhesive plaster should be placed under the spring to prevent its cutting into the scrotum, and over all an antiseptic wool dressing may be applied. (DeWitt-Boyd.)

Davat's operation: This method is strongly endorsed by Agnew, who claims that he has seen no bad

results from it in twenty years' experience.* According to this author none of the many imitations of Davat's operation are simpler or more permanent in results.

The hair is first removed from the scrotum. The cord is next grasped between the thumb and index and middle fingers about one inch below the external abdominal ring, and rolled about until the vas deferens has been isolated and slipped behind the remaining constituents of the cord. A stout acupressure needle is now thrust between the duct and the veins and along it is passed a needle armed with a stout, well waxed hempen ligature. This traverses the scrotum in front of the veins and passes out of the distal needle puncture. The loop of the ligature is now slipped over one end of the pin and its free ends tied over the other. The entire ligature now slips within the integument and becomes subcutaneous. A cork is now placed upon the sharp end of the pin, and the scrotum kept elevated on a small cushion. The pin should be removed on the seventh day. In this method it is not necessary to wait until the veins are cut through before removing the pin. A suspensory bandage should be worn for two or three weeks.

Bryant's method is as follows: The vas deferens is pushed aside and a stout needle armed with a ligature is passed through the scrotum beneath the veins. A needle set in a handle is next passed through the same opening and made to traverse the scrotum in front of the veins, emerging at the point of exit of the first needle. The distal end of the ligature is now threaded to the eye of the second needle and drawn back out of the wound of entry; the loop is thus made to include the dilated veins. The skin at the entrance and exit is now divided with a tenotome and the ligature tied tightly, its loop becoming subcutaneous. A second ligature is now applied above or below the first in a similar manner. The included area of veins may be divided subcutaneously if

*Agnew, Surgery. Vol. II, P. 566.

required. Of late years Bryant has not divided the veins. Great success and safety is claimed for this operation.

Erichsen's method: Erichsen makes an incision about half an inch in length in front and behind the scrotum. A needle armed with a silver wire is now passed into the anterior incision, between the vas deferens and veins and out of the posterior opening. The needle is now returned in front of the veins so that they are included in the loop of wire. The ends of the loop are now twisted so as to constrict the veins; the twisting is repeated daily until the veins are cut through and obliterated

Gould's method is rather novel: This operation is as follows: The vas deferens and veins are separated high up; the skin is now pinched up and transfixed by a small narrow bladed bistoury or tenotome and a small opening thus made. A needle armed with stout platinum wire is now passed under the veins which are lifted out of the opening. The wire is now fastened to the ecraseur handle of a cautery battery. The wire is heated to a cherry red heat and speedily cuts through and at the same time seals the veins. Great caution is necessary to avoid cutting the veins too rapidly and thus causing hæmorrhage. Gould reports twenty-five successful cases. The same measures of rest, antisepsis and support of the part are necessary as in other operations. The obliteration of the affected veins by the galvano-cautery, was first suggested by Dubreuil, a French surgeon

Gross' operation: This consists of subcutaneous ligature with a stout cord or silver wire. This is passed by means of a long spear-shaped needle. Pancoast fastens the ends of the ligature to a broad button, while Gross in the original method used a compress of cork. The ligature is tightened or in the case of wire, twisted every day until free.

The late Dr. Levis advised tying the ligature over a section of stout rubber tubing to obviate the necessity of tightening from day to day. The elasticity of the tubing affords the necessary traction.

Holmes' method: This involves cutting down upon the venous plexus by a very small incision and tying the veins with kangaroo tendon. The wound is then made practically subcutaneous by antiseptic dressings. The tendon is eventually absorbed.

Keye's method: This is one of the best of the subcutaneous operations. The scrotum is shaved and scrubbed first with soap and water and then with bichloride solution. A few drops of a 4 per cent cocaine solution are now injected at point of proposed puncture. Anæsthesia is not advisable as the operation is best performed in the standing position. A specially devised needle is now passed between the veins and the vas deferens high up. This is armed with an aseptic silk ligature. As soon as the needle emerges posteriorly the loop of silk is seized and secured and the needle withdrawn far enough to allow the veins and vas to come together, after which it is passed in front of the veins and out of the posterior opening. The second loop is now secured and the needle withdrawn. The free ends of the loop are now tied tightly and allowed to sink into the scrotum. An antiseptic dressing is applied and the patient put to bed. Keyes claims that ten days is the longest period of confinement to bed. One patient he claims was about in 48 hours. Weir advocates the Keyes method.

Alexander Ogston, of Aberdeen, advocates subcutaneous ligation with silk, the operation being practically the same as that of Keyes.

Henry Lee has practiced several different operations. His acupressure method is as follows: The veins are separated from the vas deferens and two pairs of stout straight needles passed through the scrotum, one needle of each pair passing between the veins and the vas deferens and the other outside the veins, which are compressed between the two. The veins are thus acupressed at two points. The two pairs of needles should be about one inch apart. The ends of each pair are fastened together by elastic bands, thus insuring continuous compression. The

veins are now divided subcutaneously with a tenotome.

Should bleeding follow a third pair of needles should be introduced—below, if the bleeding be venous; above, if it be arterial. Lee's open operation consists in the excision of a section of the scrotum, the application of ligatures a short distance apart, and excision of the included area of veins. Of late, Lee has applied temporary compression; excised the desired area of veins and finished by sealing the cut ends of the vessels with the cautery. Antiseptic dressings are of course essential to success. Ashhurst has modified Lee's first method by passing harelip pins and loops of silver wire subcutaneously. The elastic bands are substituted by silk ligatures which are removed the next day.

A. E. Barker's method (so called) consists in the application of subcutaneous antiseptic silk ligatures at one or two points.

Barwell's method consists in the subcutaneous application of a silver wire in the usual fashion. The loop may be drawn into the scrotum or left outside, in either event the free ends are twisted from day to day until the wires are free, when they are removed.

Annandale's method is essentially that of Lee, with the exception that the veins only are excised, the scrotum being left intact. Howse and Banks endorse this operation.

Bogue's method consists in exposing the veins and applying catgut ligatures at various points.

Curling's method is essentially that of Davat, it differs only in the use of two pins and the division of the veins between the pins with a fine thin-bladed tenotome.

Howse's method is as follows: The parts having been shaved and rendered aseptic, an incision 1½ to 2 inches long is made over the varicocele beginning ½ inch below the external ring. The veins are exposed with as little disturbance of surrounding parts as possible. An aneurism needle armed with chromic gut is now passed at each angle of the wound, the

ligatures tied and the included section of veins excised with a pair of blunt scissors. A horse-hair drain, horse-hair sutures, iodoform and antiseptic gauze dressings complete the operation. The horse-hair drain is removed on the fourth, and the sutures on the eighth day. Redundant scrotum may be excised or enlarged scrotal veins tied in this operation if required. As an illustration of the variance of opinion regarding this method, Jacobson terms it the safest and best of all methods and asserts its freedom from danger,* while Holmes says that it is a severe operation which has been followed by dangerous hæmorrhage, gangrene of the testis and severe and extensive suppuration.†

Kocher ties the veins at two points and divides the veins subcutaneously. Briggs, of Nashville, practices a similar method.

Treve's operation consists in an incision one inch in length, exposure of the veins, the application of two ligatures and the excision of the enclosed area of veins. A drainage tube of small caliber, and antiseptic dressings complete the operation. This is another operation illustrating the amount of originality necessary to immortalize an operator.

Weir's method is not claimed by him to be the acme of originality. In this respect Weir differs from the majority of operators. Weir states that Gagneles was the first to practice ligation, silk being the material used. He also refers to Washburne's and Fufnell's suggestions of the use of a third wire in Wood's operation. Weir prefers the subcutaneous application of carbolized or juniperized catgut, 22 cases are reported, of which only six were unsatisfactory. The average confinement to bed was eight days. According to Weir, excision of the veins was first practiced by Patruban in 1870, and revived by Nebler in 1880. Following these the operation was practiced by Nicaise, Zesas, Lee and others.

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*W. H. A. Jacobson—Operations of Surgery.
†T. Holmes—Surgery.

Reginald Harrison ligates the large vessels separately and cauterizes the smaller ones.

Abbe, of N. Y. has practiced resection of the scrotum with the application of several ligatures at various points in the exposed veins. He reports six cases with excellent results.

Fig. 1.

Case of extreme elongation of scrotum before operation. (After Horteloup.)

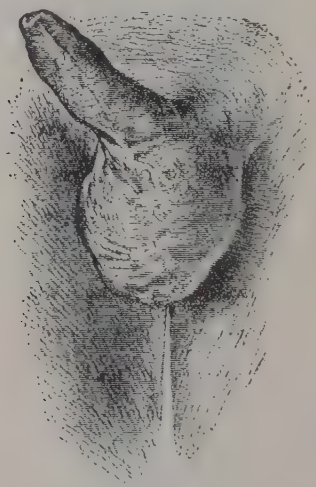
Sir Astley Cooper's operation is the parent of all operations involving excision of the redundant scrotum. In this operation a portion of the redundant tissue is grasped between the fingers and excised with knife or scissors. Hæmorrhage having been checked the edges are stitched with interrupted sutures and—

* Mèmoire à l'Academie inédit.

nowadays—antiseptic dressings applied. Van Buren characterized this operation as the only justifiable procedure in the vast majority of cases of varicocele.

Horteloup's modification of the Cooper operation involves resection of the redundant scrotum with resection of a portion of the veins behind. This operation is practiced by De Wenter and Theophile Anger. Horteloup uses a specially devised clamp.

FIG. 2.



Case of extreme elongation of scrotum after operation. (After Horteloup.)

Andrews of Chicago is the originator of a clamp (or retentive compressor) for excision designed to obviate injurious pressure on the tissues during the operation.

Hutchinson practices the open method of deligation, Rigaud and Senn advocate the ligature, the latter tying at two points; neither of these operators excises the veins.

M. Lucas Champonniére and Le Dentu both practice scrotal resection, the former, however, using no

clamp. Le Dentu excises the retro-deferential plexus.

Henry's operation is in my opinion the best of the single operations in selected cases. I was formerly inclined to endorse all that Henry claims for it, but I have latterly modified my opinion and consequently my practice, as will shortly appear.

Henry's method is a systematic modification of the old-time procedure of Astley Cooper with the addition of modern aseptic and antiseptic precautions and dressing. The operation is performed with the aid of a specially devised clamp, and with a little experience is rapid and as simple as may be.

The scrotum, pubes and thighs should be shaved and well scrubbed with soap and water, followed after drying with solution of the bichloride. The clamp is then applied from above downward, care being taken to depress it well down toward the perineum and to have the raphé of the scrotum exactly in the center of the condemned portion of tissue. The scrotum is drawn through the blades of the clamp until the testes are drawn up tightly against the pubes, and the screw tightened so that the clamp firmly grasps the skin. Carbolized silk or catgut sutures are now inserted less than one-half inch apart, or a number of harelip pins passed through the scrotum just above the main blade of the clamp, about three-fourths of an inch apart, with intervening sutures. The sutures or pins having been adjusted, the redundant tissue is cut away with scissors or knife. The secondary or removable blade of the clamp is now removed and the sutures loosely tied. The entire clamp is now removed and as soon as all hæmorrhage has ceased the sutures are permanently tied and antiseptic dressings applied. There are some details which I consider all important that will be mentioned later on. There is one point upon which Henry insists, in which I endorse him most heartily, viz.: "there is more danger of taking away too little than too much scrotum." I will add that in my opinion it is well nigh impossible to get away too much tissue where the clamp is used. An important feature

of the structure of this region is the readiness with which the integumentary tissues of the inner aspect of the thighs may be drawn over, thus assisting in forming a covering for the testes. The operation of resection in suitable cases is followed by relief of pain, and an improvement in the consistency and volume of the affected testis. Wickham claims that he has

Fig. 3.

Varicocele 7 years after resection of scrotum.

relieved pain by resection after Vidal's method had failed.

Wickham, of Paris, uses Horteloup's modification of Henry's clamp which is intended to accurately indicate the proper line of incision. This clamp has a semicircular form in the middle of the blades. I do not like this device as well as that of Henry. Henry's

operation may be modified by the use of the quilled or shotted suture if the operator so chooses.

As an illustration of the extreme degree of elongation of the pendulous scrotum and the large amount of tissue requiring removal in some instances, I append cuts of one of Horteloup's cases before and after the operation of resection. (Figs. 1 & 2.) There is one fact which to me appears very plain from these illustrations, and that is that insufficient tissue was removed. I should be greatly pleased to know the condition of this patient some years after operation, for in cases with such extreme elongation of the scrotum there is a marked tendency to recurrence, if resection alone be depended upon. In my own cases of recurrence the testes after operation were drawn up very snugly and the scrotum did not approximate so nearly the contour of the normal scrotum as is seen in the appended illustration of Horteloup's case after operation.

I greatly regret my inability to present illustrations of several of my cases of resection of the scrotum showing their condition some years after operation. It might be urged that I did not remove sufficient scrotum as an explanation of the recurrence in my cases. I have elsewhere expressed myself upon this point. I have the good fortune to possess a photograph of a case in which a surgeon of national reputation performed scrotal resection seven years ago. This surgeon reported this case as radically cured. The cut herewith appended casts an element of doubt upon the claims of the operator—a doubt which approximates conviction in the mind of the patient.

In discussing the merits of the various operative procedures for varicocele it is not necessary to take them up in detail; the *raison d'etre* of many of the specially devised (?) and named operations is apparent only to the operator. The indication in all operations is to limit or suppress the circulation in the plexus composing the varix. For our purpose, the various methods may be divided into 1, Acupressure; 2, Subcutaneous deligation; 3, Open deligation; 4, Deligation with resection of veins; 5,

Deligation with resection of scrotum; 6, Resection of the scrotum.

1. The employment of *acupressure* at the present day is an evidence of a lack of faith in modern antisepsis, and to my mind is much like the Dutchman's method of cutting off his dog's tail, "an inch at a time so that it wouldn't hurt him so much." Gradual obliteration of the veins by pressure—with or without ulceration—has all the dangers of immediate deligation as far as sepsis and trauma are concerned, and moreover these dangers are continuously incurred from start to finish, whether the process requires a few days or several weeks. I include under the term acupressure all the methods involving gradual obliteration of the veins. The dangers of acupressure are in a measure similar to those of subcutaneous deligation, shortly to be described.

2. *Subcutaneous deligation* is not an essentially dangerous operation in skillful hands. Unfortunately, however, the rank and file of operators are not as skillful as some of those who claim such extraordinary success with this method. Simple as the various methods of subtaneous ligation may appear, serious accidents have occurred. The operation is done in the dark, so to speak, and more tissue is included than is essential to the cure of the varix. A certain amount of cellular tissue is certain to be included with the mass of veins, and the strangulation of this tissue is not conducive to safety. The veins also may not be completely strangulated. The following case by McKay illustrates this point:

"In the early summer of 1888 I was called in by Dr. Habib Tubagy of Beyrout, Syria, to operate on Mr. Nasif, an unmarried carpenter of that city. Two days previous to this he had been operated on by Vidal's method, but as there was considerable swelling of the scrotum, and he was suffering much pain, he desired the radical operation by the open method. After thoroughly cleansing the parts, an incision was made similar to, but somewhat shorter than, that in the former case. The wires were found enclosing the

blood-vessels and much cellular tissue, and not tight enough to entirely arrest the flow of blood."

A portion of scrotal tissue may be included in the loop of ligature unless great care be taken. The veins being squeezed up *en masse*, there is less security against secondary hemorrhage than when they are ligated separately. Scrotal hæmatocele, phlebitis, septic infection, thrombosis and embolism are possibilities. Regarding the latter, however, it is my opinion that there is more danger of thrombosis and embolism in gradual occlusion of the veins than in their cleanly individual deligation.

Subcutaneous deligation, while not so dangerous in this respect as acupressure and its congeners, is more so than a neat open operation. Strict asepsis neutralizes all possible claims for the timid and haphazard deligation in the dark. Surgeons of some experience have included the vas deferens in the loop of ligature or wire with resultant atrophy of the testis. A case of this kind has occurred in Chicago. Atrophy of the testis, however, does not necessarily imply inclusion of the vas deferens, as ligation of the spermatic veins alone has produced it. I believe though that the danger of atrophy has been over rated. Severe varicocele is attended by atrophy of the testis; sometimes to a marked degree; as the varicocele subsides this degenerate condition becomes apparent. Tetanus is one of the possible results of inclusion of the vas deferens.

Richet, in practicing the method of *enroulement*, has observed that a vein with hardened and thickened walls is occasionally found in the midst of the mass composing the varicocele, which may be mistaken for the vas deferens. He relates a case in which both he and Denonvilliers were in doubt in the performance of Vidal's operation. Richelot cites a similar case.

Many surgeons believe that the chief danger of ligation subcutaneously is inclusion of the spermatic artery, which is deeply situated amid the mass of veins composing the varix. Ligation of this artery, it is

claimed, leads to certain atrophy of the testis. This is the opinion of Gosselin, and following him, Levis, Gouley, Jenks, Malgaigne and Henry. Nicaise is also very chary of tying the artery. Malgaigne holds that it is impossible to avoid the artery and that therefore, subcutaneous deligation is equivalent to castration. Guyon and Richelot claim that the arteries of the vas deferens and cord proper, are sufficient to preserve the nutrition of the testicle.

W. H. Bennett remarks on this point as follows:

1. That the vas deferens having been displaced in the manner usually adopted in operations for varicocele the spermatic artery does not accompany it, but remains with the spermatic veins.

2. That in cases of varicocele the division of the main trunk of the spermatic artery, together with the veins, if the ordinary principles of surgical cleanliness be observed, is not only harmless to the testicle, but probably aids in the ultimate relief of the affection by diminishing the pressure of blood going to the testis at the time when almost all the returning veins are suddenly obliterated.

3. That the division of the deferens, spermatic artery, and spermatic veins, which entails a section of apparently the whole cord, is not necessarily followed by sloughing, or even subsequent wasting, of the testicle, provided that a perfectly aseptic condition of the wound is maintained. *

With reference to the same subject, A. W. M. Robson says:

"In 1886 I published a series of ten cases of varicocele treated by excision, the operation differing very slightly from that recommended by Mr. Bennett in his paper published in *The Lancet* of Feb. 9, 1889. I have had the opportunity of seeing many of these cases since, and find that there has been absolutely no atrophic change or other apparent alteration in the testicle, and yet in all of them not only was the bundle of veins but a portion of the spermatic artery re-

Lancet, March 7, 1891.

Brit. Med. Jour. March 21st, 1891.

moved, for it is quite easy, as Mr. Bennett says, to see the open mouth of the artery in the mass of tissue removed, leaving no doubt about its division. In all my cases an aseptic course was pursued, and in none was there any trouble from orchitis."

FIG. 4. FIG. 5. FIG. 6. FIG. 7.

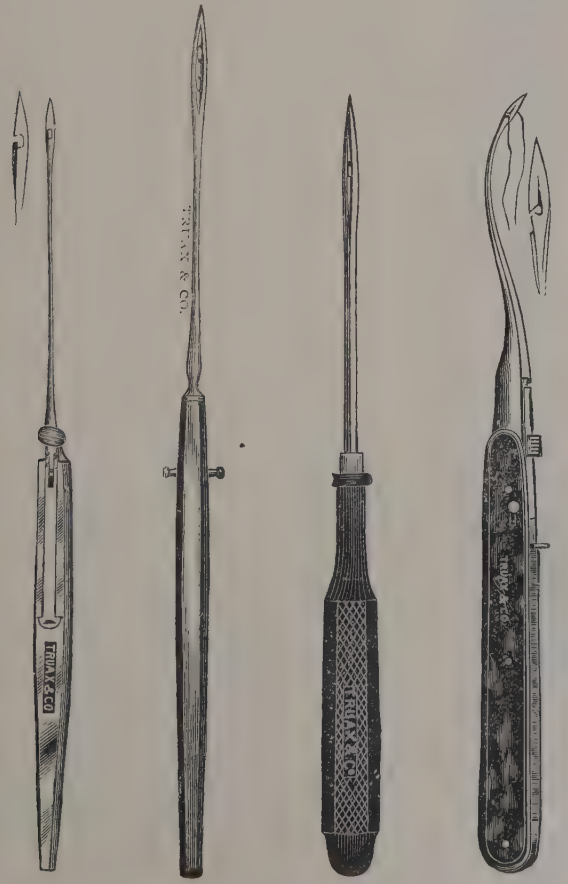


Fig. 4.—Keyes's improved needle for varicocele.

Fig. 5.—Keyes's varicocele needle, plain.
Fig. 6.—Whitehead's varicocele needle.
Fig. 7.—Reverdin's needle.

Sir James Paget reported a case of Pyæmia following subcutaneous deligation. Curling spoke of several cases of *enroulement* practiced by Roux, in which death resulted. Thievenow had a case of death from septicæmia. Howe reported a fatal case of peritonitis after ligature. That severe pain and even tetanus should be liable to occur in subcutaneous deligation, is not surprising if we take into consideration the numerous and sensitive nerve filaments which supply the involved parts. The inclusion of these nervous structures in the ligature is to a great extent unavoidable. The danger is reduced to a minimum however, by care in separating the structures of the varicocele, and including as little tissue as possible in the ligature.

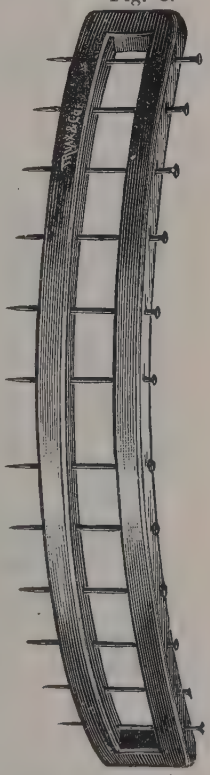
I do not, however, condemn subcutaneous deligation in *toto*, and have performed it myself a number of times. In proper hands and under some circumstances it is well enough. I believe nevertheless, that there are better and safer methods.

There is no real necessity for special or complicated needles and other devices in this operation, although some one of them may be used if at hand. Juniperized silk is probably the best substance for ligature.

After proper antiseptic precautions the scrotum is gathered up in the hand and transfixed from before backward with a small tenotome; the knife is then withdrawn and the scrotum allowed to drop back in place. A fine stiff probe (eyed) threaded with juniperized silk is now passed through the punctures between the veins and vas deferen, and passed back outside the veins still carrying the ligature, to emerge at the point of original entry in front. The probe is removed and the ligature tied and dropped. The usual precaution of rest is now taken. Any of the various forms of needles may be used if desired. The results of subcutaneous deligation

when properly performed are certainly good, a large proportion of cures resulting. This in a measure compensates for certain undesirable features of the method.

Fig. 8.



Andrew's retention clamp for varicocele.

3 and 4. There is little choice between *open deligation without disturbance of the veins and deligation with resections of the veins* excepting possibly, (this being very remote,) the additional danger of sepsis in the latter. Division of the veins with the cautery wire is as yet untried, but in spite of the favorable report of its originator,* I believe it to be the most dangerous operation yet devised. The dangers of the open method are in a less degree those of sub-cutaneous deligation with the exception of that of inclusion of the vas deferens —this cannot occur. If the open method be selected the point of election should be as high up as possible, and as small an incision made as is practicable to work through. The veins are thus ligated in their straight portion with very little mauling about of the cellular tissue. The higher up the deligation the less the danger of sepsis, cellulitis and atrophy of the testis, the latter advantage being possibly due to the avoidance of trauma of the smaller veins, upon which we must rely for return circulation after obliteration of the vessels composing the varix. In a general way it may be said that deligation at a single point in each vein is safer than at several points in the same vessel; it is also quite as effectual. The results

*Gould.

of the open method performed in this manner are excellent and the danger under antisepsis is very remote.

5. *Deligation with Resection of the scrotum.*—I consider this to be the ideal operation in by far the majority of cases demanding surgical interference. Much depends on the method of performance;—the important details as far as the danger to life is concerned, affecting chiefly the deligation. Under proper antiseptic precautions I do not believe that the scrotal amputation complicates, or at least enhances the dangers of the operation. Deligation with resection is indicated where the varix is large and the scrotum very lax and pendulous. The removal of the latter gives the best prophylaxis against recurrence of the varix. The results are likely to be better than those attained by any of the other methods.

FIG. 9.

Lewis' scrotal clamp.

6. *Resection of the scrotum* is the safest operation for varicocele and according to Henry is a radical cure in the true sense of the term. He reported fifty-nine operations some years ago, which as far as he could learn were radically successful. This same operator has since reported a number of cases at various times, for which he claims an equal degree of success. In my early experience with Henry's operation I was inclined to accept the statements of the ardent advocates of the method without much question.

A wider experience and observation has, however, convinced me that too much has been claimed for the operation. To be sure, as Henry *naively* says, it makes little difference if the operation is again neces-

sary after a lapse of years, as the method is perfectly safe, but this is begging the question in regard to an alleged "radical cure." In very large varicoceles the

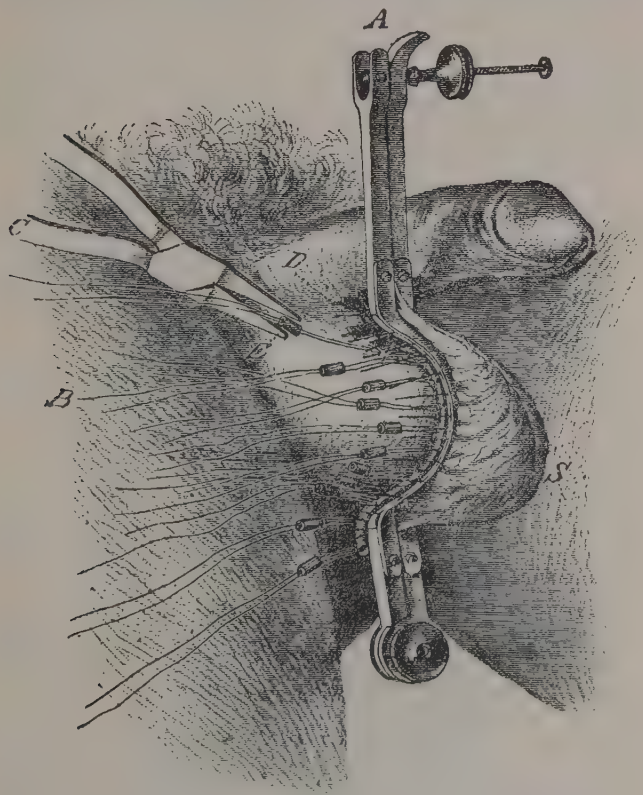


FIG. 10.
(After Wickham.)

changes in the texture of the venous walls are such that pressure and support alone are insufficient to secure restoration of their natural consistency and caliber, even though the pressure be sufficiently firm and continuous. There is little elasticity in the remaining portion of the scrotum, and the tone of the part is

apt to remain as impaired as before the operation—the same constitutional conditions prevailing. It is my opinion that stretching and relaxation of the new "natural suspensory" or scrotum will recur in the majority of severe cases sooner or later. The varicocele may not be as severe as before the operation and the more urgent symptoms may be relieved, but there is nothing edifying in the spectacle of a good sized varix a few years, or perhaps months, after a so-called radical cure.

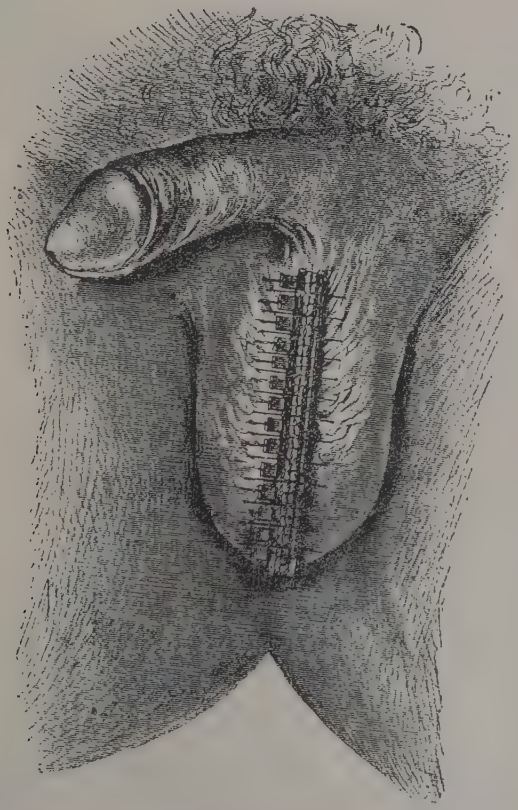
I desire to do the method full justice however, and am free to say that the subjective symptoms do not always recur *pari passu* with a return of the varix; but I am discussing a "radical cure" and hair-splitting is unnecessary. The patient is apt to forget the original subjective symptoms and gauge the value received by the ocular and objective evidence at his command.

In moderate varicoceles and in quite young subjects the scrotal tissues are apt to retain a certain degree of consistency and elasticity, and the veins have not usually entirely lost their normal tone. Under these circumstances scrotal resection is the ideal operation. It is far better, in my opinion, for a patient to submit to this operation than to be annoyed by suspensory bandages for the rest of his days. It is safe, when properly performed, and gives an ideal result.

One of the most systematic operations for variocele is that advocated by M. Edmond Wickham. This surgeon uses the Horteloup clamp and performs the operation with the strictest antiseptic precautions. The novelty of his method consists in his mode of fastening the sutures. The sutures are passed a short distance apart, and are double; at one extremity they are fastened to a thin strip of lead moulded to accurately fit the curve of the scrotum after its curtailment. The sutures are passed through between the blades of the clamp before its removal. Between each suture is passed a hare-lip pin. Small sections of lead tubing are passed over the ends of the double sutures, and at the completion of the operation are clamped down firmly in a manner similar to that employed with split shot.

I append illustrations of Wickham's method, not because I recognize its superiority, but because the cuts represent quite accurately the proper method of application of all forms of clamps and the passage of the sutures. As already remarked in connection with the Horteloup clamp, I am inclined to believe that there is likelihood of too much scrotum being left where this clamp is used for the purpose of outlining

FIG. 11.



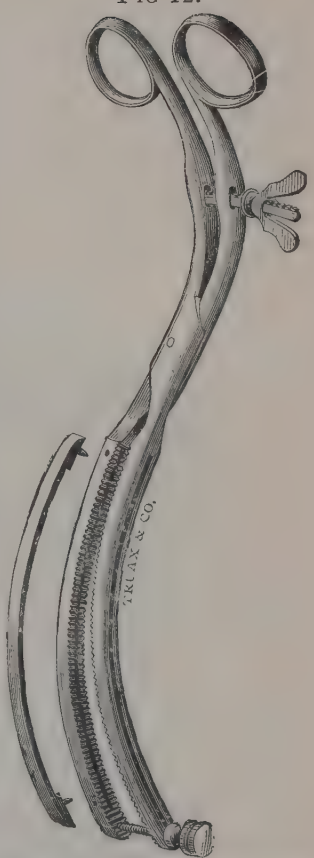
After Wickham.

the proper amount of tissue for removal.

In describing what I believe to be the ideal method for large varicoceles it is not my intention to advocate it as a routine practice. The surgeon must necessarily at all times use his best judgment and select the operation apparently best suited to the exigences of the case in hand.

I will simply describe the method which I believe to be the safest and nearest approach to a radical cure in the vast majority of cases of pronounced varicocele. I shall not follow the usual custom of claiming the method by virtue of some little modifications of technique. As I have already hinted, the *raison d'etre* of so-called special methods usually exists only in the mind of the operator. I do not know whether this particular combination of the old and new is practiced by others, nor do I consider it material to the subject in hand. If it is so practiced the operator is privileged to label it to suit himself, providing he will permit me to use the label.*

FIG 12.



Henry's improved scrotal clamp.

*Since this article was written I have noted the following by A B. Barrow:

"I have simplified the operation of varicocele slightly, by making the incision over the external abdominal ring only, and

The bowels having been emptied by a saline or castor-oil. the latter being perhaps preferable, the scrotum, pubes and thighs are thoroughly scrubbed with green soap and bichloride $^1/_{2000}$ and then bathed with a bichloride solution $^1/_{1000}$.

This completed the patient is anæsthetized during which process the scrotum is wrapped in a towel wet with the bichloride solution. It is hardly necessary to say that the operator is now supposed to wash his hands and remove all superfluous subungual organic matter. Everything, including the operator's conscience being thus prepared and all instruments having been asepticised by boiling water, an incision one inch or a little more in length is made beginning just below the external abdominal ring and parallel with the spermatic cord. This is carried down until the cord and its accompanying veins are exposed. The number of veins varies in my experience ; they are here quite straight and when emptied of blood

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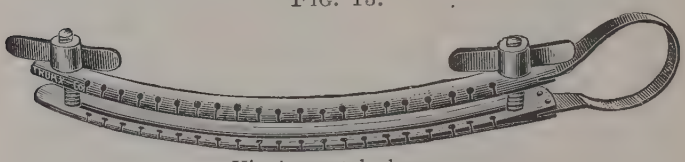
not extending it into the scrotal tissues at all, as I found that it was quite easy to pull up the veins into this limited opening and ligature them; and in this situation there is no liability to injure the vas deferens, so I have discontinued the use of the pins I then recommended. But I attach the same importance to that point in which I advocated the clearing and ligaturing the veins first at the external abdominal ring, where it is easily done; and, having cut them through, to pick up the distal ends of the veins, and lifting them up to strip off the surrounding tissues of the cord as low as the upper part of the testicle; then apply the lower ligature, cut the veins through again, and allow the testicle, which has been drawn up to the wound, to slip back into the scrotum. In this way I have operated upon a large number of cases, in a few instances removing the veins of both sides at the same operation, and often doing the operation in association with the radical cure of hernia, and I have had unvarying success both as regards the rapidy of healing of the wound, the cure of the affection, and the satisfactory condition of the testicle. Several cases have been afterward admitted into the services.

"I have not found the testicles diminish in size in any case, but, on the contrary, it usually increases. In some cases I have observed that there is a tendency for the tunica vaginalis to become slightly distended with fluid when the patient first begins to walk about, but this condition disappears during the night when the patient is lying down."—*Brit. Med. Jour.*, March, 21, 1891.

quite small. The cord and veins are hooked with an aneurism needle out of the wound which is meanwhile occasionally irrigated with bichloride solution; the veins are now separated and several of the larger ones ligated with a single ligature of medium sized juniperized silk; the ligatures are cut short and the veins and cord dropped back in place. If there is any difficulty in reposition of the cord it is readily overcome

Fig. 13.



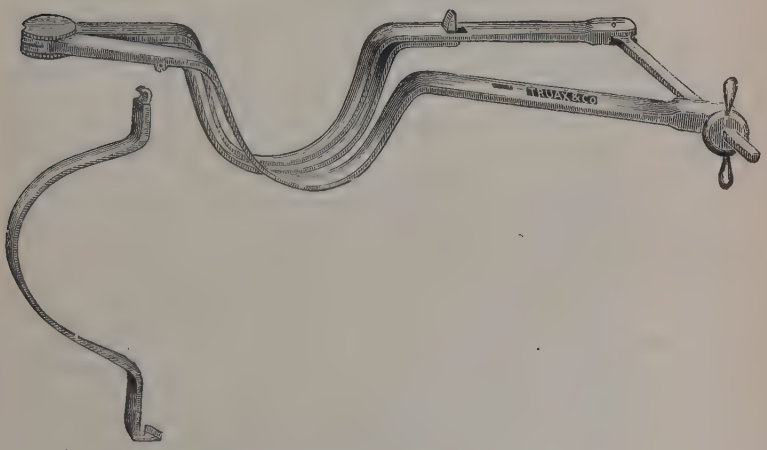
King's scrotal clamp.

by traction on the testicle. The wound is now irrigated and thoroughly dried, towels instead of sponges being used for this purpose. Sponges are far inferior to soft dry towels for checking oozing and for many reasons to be preferred. Several fine stitches of juniperized silk are now inserted, the wound closed and dusted with iodoform. During the remainder of the operation the wound should be compressed with antiseptic gauze by an attendant. The next step is the application of the clamp—I have used both Henry's and a modification of King's clamp,* but any other good clamp will do. (Fig. 13.) Care should be taken to divide each side of the scrotum equally, and to include sufficient tissue in the clamp. As already observed it is well-nigh impossible to remove too much. I have operated in cases where I have removed the clamp after excision of the scrotum for the purpose of ligating a vessel and have found so little tissue left that I had extreme difficulty in covering in the testes, yet the new scrotum has not only proved sufficient, but I have wondered whether it would not have been practicable to remove more tissue.

*King's clamp is lighter and less bunglesome than Henry's.

The point of election having been determined upon, the redundant tissue is quickly cut away along the face of the clamp. Juniperized silk sutures and harelip pins are to be used and may be inserted either before or after the excision, but always before removing the clamp. There should be as little delay as possible, as the prolonged pressure of the clamp produces more or less bruising of the loose scrotal tissues which is not conducive to prompt union. Three or four pins are usually enough; these should be inserted at divided intervals and the silk sutures interposed in sufficient number to prevent gaping and maintain accurrate apposition. Henry covers the heads of the pins with sealing wax and embeds their points in small corks.

Fig. 14.



Horteloup's Scrotal Clamp.

A plan which is perhaps better and one which I occasionally practice is to pass reinforcing sutures of silver wire instead of the pins. A single strand of wire is used and its ends knotted upon small rubber buttons or fixed in split shot. The tension is so ex-

treme that something more than ordinary sutures is required.

The secondary blade of the clamp having been removed the sutures are lightly tied and the main clamp removed. If the sutures be permanently tied before removal of the clamp the surgeon may have to reopen the wound to tie some spouting vessel. Vessels should be twisted where possible, or traversed by a suture. An assistant must now press back the testes else they will pop out in a truly demoralizing fashion. I well remember my first experience in this respect. I wondered where on earth I was going to get skin enough to cover those obstreperous appendages.

All hemorrhage having been checked the wound is permanently closed. Too much care cannot be taken in checking hemorrhage, as there is an especial tendency to venous oozing. The formation of a clot beneath the wound will not only prove a source of septic danger, but will prevent speedy union. There is also the danger of serious hemorrhage of a passive character. To one unfamiliar with operations about these parts the tendency to prolonged oozing is peculiar; I have noted it for several days after a most careful operation for varicocele.

The danger of hemorrhage is in a great measure dependent on the constitutional condition of the patient, as shown in one of my cases.

The occurrence of concealed hemorrhage and formation of clot can be readily avoided by the insertion of a small drainage tube along the line of suture at the lower angle of the wound. I prefer for this purpose decalcified bone, but rubber will, of course, answer the purpose.

Henry uses adhesive plaster as an additional support to the wound, but I have found graduated compresses to be all that is required.

Having closed the wound and made provision for drainage, the parts are irrigated with the bichloride solution, dried, the edges sprinkled with iodoform and a piece of oiled silk or protective laid along the edges

to prevent adhesion of the subsequent dressings. A quantity of borated cotton and antiseptic gauze in which a hole has been cut for the penis is now applied and the whole secured by a three-tailed bandage secured at the waist. A light diet should be advised, and no attempt made to move the bowels for four or five days. When a movement does occur the parts should be carefully supported and a bedpan used.

The sutures should not be removed for six or seven days or gaping will quite likely occur. So extreme is the tension when the operation is properly performed that gaping is quite frequent. The drainage tube should be removed in three or four days. The silver pins, or wire sutures, as the case may be, can be allowed to remain for several days longer if necessary. An excellent plan, where gaping occurs, is the application of stout mole-skin plaster on either side of the wound; through the edges of the plaster holes are punched and the two strips laced together with a stout silk or hempen thread, shoe-string fashion. The strips of plaster should extend well out to the thighs. Although a speedy union is desirable as lessening the liability to inflammatory complications and enabling the patient to get about soon, gaping of the wound has some compensatory advantages. The cases which heal by granulation yield a firmer support to the varix from cicatricial contraction and inflammatory thickening. This was well illustrated by one of my cases in which erysipelas occured.

The patient may be allowed to get up in two weeks if no complications arise.

My operations for varicocele now comprise forty cases of all methods, ten of which have been subcutaneous deligations of the veins, sixteen of simple resection of the scrotum, four of resection of the scrotum with ligation of the veins at several points, one of open deligation with resection of the veins, one of open deligation without resection of veins, and eight of ligation of the veins high up with resection of the scrotum. A recital of these cases in detail would be

monotonous, hence I will give only the points of interest developed by their study. I have had no deaths and but few cases in which there was serious reason for alarm. In some few instances, however, there

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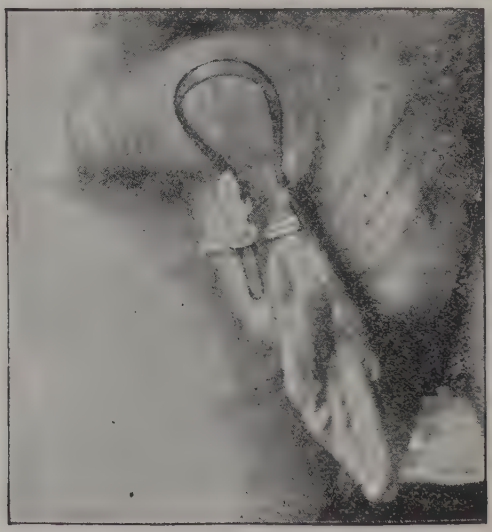

Application of King's Clamp.

FIG. 15.

were certain features which caused me considerable uneasiness for a time.

The youngest patient operated on was eighteen and the oldest forty years of age. Most of the patients were between twenty and thirty. The duration of the affection varied, according to the patients' statements, from one to twenty years. The question of duration, however, is not of importance, nor can it be arbitrarily settled in any case. The duration of varicocele is

necessarily a relative matter, and implies the period since the condition was first brought to the patient's attention. Obviously the sexual hypochondriac who proverbially seeks for what he does not wish to find, is likely to discover the tumor earlier than one in whom the sexual functions are not a matter of especial concern. Patients with neuralgic manifestations, referable to the cord, testes or penis, are apt to discover their varix at an early period.

The causes of varicocele, as suggested by my cases, is also difficult to outline arbitrarily. Masturbation and sexual excesses are the causes which are usually assigned for varicocele. Often, however, sexual excesses do not appear to be sufficient *per se* to account for varicocele, but no other cause is discoverable. It is certain that only a small percentage of masturbators have varicocele. As, however, nearly all boys masturbate, it is safe to say that about all subjects of varicocele have; hence the *post hoc ergo propter hoc* argument is quite natural. I believe that I am safe in saying the sexual abuse alone never causes varicocele, and that it is an effective cause in direct proportion as it is associated with some constitutional fault involving vaso motor perturbation and laxity of tissue, with especial reference to the venous walls.

As illustrative of the important relation of general vascular atonicity to varicocele, one of my cases already mentioned is certainly striking. This case was under the charge of Dr. S. V. Clevenger, one of our leading neurologists, who was treating him for epilepsy. The doctor observed scrotal hæmidrosis, and referred the patient to me as a curiosity. On examination I found a large varicocele, which the patient claimed was causing him great annoyance by its weight and the consequent dragging upon the cord and back ache. On inquiry I elicited the fact that he was exceedingly hypochondriacal. A peculiar feature of the case was the fact that the seminal emissions, like the sudoriparous secretion of the scrotum, was

heavily tinged with blood. Urethrametry revealed several strictures in the penile urethra.

As the epileptic attacks were infrequent and had developed since the acquirement of the strictures—and the patient claimed since the development of the varicocele—it was thought advisable to operate. As I considered the hemorrhagic secretions to be a fair warning of the danger of hemorrhage, I ligated the varix subcutaneously, and at the same time performed a dilating urethrotomy. As I anticipated, a terrific hemorrhage from the urethra resulted. The bleeding continued for three days and necessitated the constant presence of an attendant who applied pressure by an ice bag during that time. There was considerable induration of the veins and a sharp orchitis following the ligature. The result however has been excellent so far. The epileptic attack which was expected at the time of the operation has been postponed for nearly four months. I do not say that this fact is proof of the causal relation of the stricture and the varicocele to the epilepsy. Time may show this however. Like many operations upon the skull for epilepsy, the result in this case may be due to a temporary revulsive effect upon the nervous mechanism which has merely postponed the usual explosion. I will state however that the patient's general health is much better, and that he has markedly increased in weight.

Several of my cases have apparently followed an epididymitis or traumatism. In how far these causes were responsible for the varix in these cases I am unable to say. Very often the only relation between epididymitis or injury and varicocele, is the fact that the latter has been first discovered after these accidents. Personally I think that either of these causes may be operative. I have had one case of varicocele undoubtedly due to athletic strain. All authors I believe, admit the possibility of a kick producing varicocele. In several instances I have had patients with small varioceles who happened to be

under observation, whose varices increased after an attack of epididymitis. Anything which will impair the tone of the involved part, or induce circulatory obstruction, should be operative in producing or at least aggravating varicocele.

I have operated on two jockeys each of whom attributed his varicocele to excessive horseback riding, in one case the patient recalled an injury in springing into the saddle. There is no question in my mind as to the causal influence of excessive horseback riding in producing varicocele. All old cavalrymen will support this opinion. The records of the pension office afford abundant proof. Dr. James A. Lydston who has been connected with the pension bureau for some years, informs me that varicocele is one of the most frequent disabilities presented to the attention of the department, and that it is especially prevalent among those who served in the cavalry. How important the appearance of two jockeys is in this connection I cannot say; it may have been a coincidence, as I am unable to state that the prevalence of varicocele among jockeys is a matter of comment. Other things being equal, they would be less likely than other riders to injure themselves, as they ride on plain saddles, and they cannot therefore experience the disagreeable effects of a blow with a pommel. Jockeys as a class are young, healthy, light weight subjects who are well kept and not subject to vascular debility.

The symptoms for which the patients upon whom I have operated have sought relief have varied. In several instances the principal annoyance complained of was the deformity. One of my patients, for example, was annoyed by the frequent comments which were made upon his appearance, his varicocele being so bulky as to be quite prominent even when his trousers were amply large. There was no other symptom in his case which was of any particular moment.

In several other cases there was noticeable deform-

ity, but associated with it were sexual hypochondriasis and various reflex disturbances. In some instances mechanical discomfort has been chiefly complained of. In several cases intertrigo, and in one instance severe chronic eczema, constituted the chief source of annoyance. Pain in the back, shooting pains along the cord and penis, and neuralgia of the testes have been frequent. In some cases irritability of the bladder has been complained of. In nearly all instances sexual hypochondriasis, with or without spermatorrhœa, has been pronounced. I do not wish to be understood as asserting that all of the symptoms for which the patients sought relief were necessarily dependent upon the varicocele. The nocturnal pollutions, spermatorrhœa and prostatorrhœa, might have been due in many of my cases not to the varix *per se*, but to the same underlying cause as the varix. In several instances the principal symptoms were not removed by the operation.

In but one case have I had sufficient hemorrhage to give rise to any particular annoyance. In this case there was a tendency to hemophilia. This, with my failure to use a drainage tube, resulted in a concealed hemorrhage, the formation of a clot, and after removal of the latter, free passage oozing for some days. In this case there was the most extensive ecchymosis that I have ever seen, the tissues from the umbilicus down to the middle of the thighs being as black as extravasated blood could make them. The result, although alarming in appearance, was not a matter of concern, but the patient became very much frightened at what was apparently, as he expressed it, a general mortification. A tendency to ecchymosis exists in all cases of operation for varicocele, and this should be remembered, else both surgeon and patient are apt to be demoralized by the consequent appearance of the parts. In several other instances there has been a tendency to oozing for some days, thus precluding the possibility of primary union.

The use of the drainage tube is, in my estimation, one of the most valuable points in all operations involving resection of the scrotum. Concealed hemorrhage, tension and sepsis are not liable to occur when the tube is used; there is unquestionably danger of these accidents without it. As long as marked oozing persists the tube should be allowed to remain. Should severe hemorrhage occur after the operation has been completed, the tube facilitates hot water irrigation or the application of styptics, the former being the best hæmostatic.

The healing of the wound in a fair proportion of my cases of resection of the scrotum has been by first intention; but I have found that there is in many cases a tendency to gaping, even though the sutures be allowed to remain for a week or more. Indeed, I am inclined to believe that when there is no tendency to gaping, hardly enough scrotum has been removed. The gaping is always due to the extreme tension upon the parts incident to a thorough operation. It may be prevented in many cases by allowing the sutures to remain in for some little time. If juniperized silk and silver wire be used, as I have suggested, the stitches can be allowed to remain in from five to eight days with impunity.

In several instances I have had slight sloughing of the scrotum, evidently from extreme tension. In these cases, however, the result has been even better than those in which primary union occurred. No matter how much tissue may slough the parts become covered in by an excellent scrotum with almost marvellous rapidity. Although the fit is decidedly snug at first, the testes soon accommodate themselves to their new investment. I have never seen a more delighted patient than one of mine in whom cellulitis occurred as a consequence of infection after operation.

I recall a case of cellulitis of the scrotum, not however following operation, that occurred some years ago in the New York Charity Hospital, in which

the testes were bared completely, yet by judicious strapping and occasional stimulation of the granulations a good scrotum was finally secured. I saw several other cases of scrotal cellulitis in the New York State Emigration Hospital during my term of service in that institution. Contrary to the rule in such cases, none of these died. In all there was extensive sloughing of the scrotum, but repair once begun was very rapid. Such cases teach us that in resection of the scrotum there should be little fear of excising too much tissue. The more excised the better the result; and while it is always desirable to obtain primary union where possible, I feel justified in saying that the more gaping, the better the result. Cellulitis, *i. e.* erysipelas, is not a source of danger in resection of the scrotum unless direct infection occurs. This was the explanation in one of my hospital cases which I have already mentioned. The failure of the wound to unite promptly is undoubtedly in some cases of scrotal resection due in a measure to the prolonged pressure of the clamp. Sloughing may be partially explained in this manner. As I have already remarked, my faith in resection of the scrotum as a radical cure for varicocele has been somewhat shaken by several of my cases.

In one instance I have had an opportunity to watch the gentleman for nine years since the operation, and although I removed all the tissue necessary to an ideal operation in this case, the varix which was a very large one has recurred, and is now nearly as large as ever. The symptoms however for which he sought relief, have not returned. In two other cases there has been a moderate recurrence. The objection may be urged that I have not taken off enough scrotum. My conscience is clear upon this point however, as I have invariable taken off all I could in reason and still retain a covering for the testes.

My operations of subcutaneous deligations have been successful, but on the average have given me

more uneasiness and trouble than those in which I performed the open operation. Induration, pain and orchitis are some of the disagreeable features which I have experienced from this method of operation. I have found that the operation of tying the veins low down is much more objectionable from this standpoint than that involving ligation higher up as in the combined operation which I have recommended. It is obviously safer to ligate the veins at their comparatively straight portion, where the changes in the vascular walls are at a minimum, and there is the least necessity for mauling about the investments of the testes and tearing up the planes of areolar tissue. I have already given my reasons for advocating the combined operation. In one of my cases of combined operation, I ligated the vessels at several points rather low down. This patient did fairly well for two weaks, when he arose against orders, or rather over exerted himself when allowed to sit up. As a consequence, phlebitis, cellulitis and consequent slight suppuration developed. During convalescence this patient developed severe *la grippe* with marked pulmonary symptoms, hæmoptysis being profuse, giving me great apprehensions of pyæmia with embolic pneumonia, etc. Although never very strong lunged, this patient perfectly recovered.

In four or five cases stricture existed and urethrotomy was performed simultaneously with the operation for varix. I can see no objection to this procedure, and I have had but one case in which the operation upon the urethra afforded any complication. This instance, already alluded to, was one in which severe urethral hemorrhage resulted.

Two cases have come under my observation which suggested the possible development of hydrocele as a result of operation for varicocele. In one of these cases, operated on by me several years ago by sub cutaneous deligation, I again operated a short time since for an encysted hydrocele upon the same side. In another instance I operated for hydrocele in

a case in which subcutaneous deligation had been previously performed for varicocele of the same side by another practitioner. The patient was complaining of the same symptoms, according to his statement, that had characterized the original varicocele. My operation by hydrocele, although perfectly successful *per se*, has not relieved the symptoms from which he was suffering. He is now giving me a great deal of annoyance by his complaints of severe neuralgia of the testicles. The irritation of sunken sutures, which had accidentally traversed the tunica vaginalis, or obstructed venous circulation, plus irritation, might account for these cases. In ligating low down the tunica vaginalis is apt to be quite roughly handled, if not actually traversed by the ligature. Acute hydrocele is a very frequent element in the swelling resulting from ligature of the varix. As already remarked, the testis itself may be involved. Injury of the fascial envelopments of the cord high up is not important and is a necessary factor in the operation which I have suggested.

I have never performed an operation for double varicocele. Indeed, I have met with no case which, to my mind, required such operation. Even though a case of double varicocele should apparently require a double operation, I should hesitate to incur the risk of atrophy of both testes slight though I believe it to be. In ordinary single operations the risk of atrophy is doubtless overrated. This is probably due to (1) the relative appearance of shrinkage incidental to the subtraction of the swelling of the varix *per se*. (2) Continuation of atrophy, which was steadily progressing prior to operation. (3) Atrophy due to embolism, syphilis, epididymitis, etc. Theoretical considerations, however, do not always mollify the patient where actual atrophy of the testes occurs. It will be remembered that Delpech was assassinated by a man upon whom he had performed a double deligation for varicocele some years before. On autopsy the murderer's testes were found to be soft and shrunken, presumably from the operation.

I have had no case in which atrophy of the testes has followed an operation, and have had several of scrotal resection, in which the testes became firmer and larger after the operation. Among my cases was one of scrotal hæmatocele, resulting from the injury of a large varicocele. In this case suppuration occurred, and I was obliged to lay the part open; as soon as it was healthily granulating I removed the pendulous scrotum with an excellent result. While I have not been able to follow all of my cases for a great length of time, the immediate results have been eminently satisfactory, and in those cases which I have been able to follow for a period of several years, I have no occasion to regret the operation. In the majority of instances the relief obtained has been so marked that the patients were greatly delighted. That this has always been a physical result of the operation I do not claim, nor do I think that under the circumstances it is a question of great importance.

In general I have found that the combined operation of high ligation of the veins with resection has been much better from the standpoint of economy of time than the subcutaneous or ordinary open operations of ligation. Painful induration and swelling of the testes with consequent disability and impeded locomotion are very frequent in my experience when these operations of deligation have been performed.

In nearly all of my cases, there has been a marked improvement in the patient's mental condition. Hypochondriasis has been relieved and sexual vigor improved or restored. Pain has been relieved in most instances. A notable exception is the case already mentioned, in which hydrocele followed an operation for varicocele and severe pain persisted after cure of the hydrocele.

OBSERVATIONS ON STRICTURE OF THE URETHRA.

It is not my intention to attempt the consideration of the entire subject of stricture of the urethra in this paper; it would not only be tiresome, but of little practical value. I desire, however, to call attention to a few points which have appeared to me suggestive and practical. In presenting these points my remarks must, of necessity, be of a more or less desultory character.

The causes of stricture are too familiar to require much discussion. There is one point, however, in which I beg leave to differ with the accepted authorities upon this subject. It is asserted that it is upon the long continuance rather than the severity of urethral inflammation that the formation of stricture depends. It will nevertheless be found that the so-called long continued inflammation either consists of a series of bastard claps, coming on at greater or lesser intervals, or of a chronic and continuous pathological process following directly in the wake of a virulent urethritis. Both these conditions are dependent upon the damage done by the primary virulent process, and the probability of their occurrence is directly proportionate to the severity of the primary attack. In brief, stricture does not form because the inflammation is long continued, but the inflammation is protracted because a stricture, or the

foundation for it, was formed during the acute urethritis.

The direct relation of stricture to the acuteness of the primary inflammation will appear when the mechanical factor in the localization of stricture is taken into consideration. The explanations which have been advanced to account for the localization of stricture at one point in the canal rather than another, have seemed to me unsatisfactory. By the consideration of a very simple mechanical factor, however, the explanation appears quite simple. I believe that friction is the determining element in the causation of all strictures not due directly to chemical or mechanical violence.

The urethra is by no means a passive structure, but is at greater or lesser intervals called into functional activity; the particular function which concerns us here being that of urination. We will consider the urethra for our present purpose as an elastic tube, comparable to a section of rubber hose, through which, at variable intervals, a certain quantity of fluid is forced at a certain degree of hydrostatic pressure. This tube is not uniformly distensible, but is narrower at some points than others. The points of normal contraction are too well known to require description. In addition to these points of normal and absolute contraction, I believe that there are in the pendulous portion of the canal points of relative inelasticity and indistensibility. These are the so-called points of normal contraction of Weir and others, and constitute a large proportion of the strictures of large caliber of Otis. They are the battle-ground of the warring factions, among whom the chief bone of contention is, "to cut or not to cut." And I hope to be able to show where the "rub" comes in.

When the urethra is in its normal condition there is no abnormal strain at any point in the canal; and while it may balloon out unequally under the pressure of the escaping urine, there is no injurious friction. Now, supposing the caliber of the urethra to be diminished by inflammatory infiltration to one-half, or—if we take its normal property of distensibility into consideration—perhaps one-tenth its normal capacity, the same degree of hydrostatic pressure prevailing, what

is the consequence? Necessarily friction. And where is that friction the greatest? Obviously, at the points of least distensibility—*i. e.*, at the points of normal contraction and of relative inelasticity. These points are either at the anatomical lines of demarkation of the divisions of the canal, or in situations where the elastic and muscular elements of the urethra are sparse as compared with the fibro-connective tissue. A very simple analogy will show the relation of these two conditions to the friction alluded to. If a string be tied about a rubber tube so as to constrict it, we have a condition similar to a point of normal urethral contraction. Tie another string about the tube in such a manner that, while it does not constrict it, there is a restriction of expansion under hydrostatic pressure, and we have a point of relative inelasticity. In my opinion these points of relative inelasticity can be demonstrated in almost any urethra. Regarding the actual points of normal contraction, there is of course no question.

Using this same rubber tube as an illustration, we will diminish its caliber throughout, leaving the strings in situ. We will now apply the hydrostatic pressure at frequent intervals and consider the result. Obviously there will soon be a wearing away of the tube at the site of the strings; and there is the rub in the case of the urethra.

We will now add another element to the wearing process. In the course of acute urethritis, there is a tendency to a rapid formation of epithelium. This is a reparative, a conservative process, but unfortunately a certain biological law comes into play here, viz: In inverse proportion to the degree as differentiation of cells is their rapidity of proliferation, and their tendency to degeneration. The consequence of this law is an erosion at the point of friction, and secondarily, a plastic deposit to resist strain. Comment upon this is not necessary. The subsequent metamorphosis of this deposit is well known. In the pendulous urethra especially, and probably also in the fixed portion, the plastic deposit may possibly absorb, but the friction remains and a gleet is often kept up. The points of normal contraction and relative inelasticity have now become of pathological significance.

Now, I wish to ask what difference it makes whether these points were primarily present in the canal as normal conditions or not, as regards their surgical relations from the standpoint of treatment? The question is not, whether they are adventitious as claimed by Otis, or normal as claimed by Weir, but what is their relations to the morbid state of the canal? I claim that the difference between the two conditions is one of degree and not of kind, and I can see no logic in the dispute upon either side.

From what has been said I think that the direct relation of stricture to the severity of the primary urethritis may be clearly seen.

It is a self-evident proposition that if what I have said regarding the relation of stricture to friction be true, the same holds good with relation to granular, congested and eroded patches in the canal. I believe, moreover, that within certain limits the indications for treatment may be the same. In addition to the element of friction in producing strictures and other lesions of the urethra, I acknowledge the importance of retained infections and inflammatory products at points of narrowing.

M. Desnos has recently called attention to what he terms slight traumatisms of the urethra during erection, as a cause of stricture. In my lectures for ten years past, I have claimed that slight injuries of the mucous membrane and perhaps of the corpus spongiosum, frequently result duting urethritis, as a result of erections while the elasticity of the spongy urethra is impaired by plastic exudate. These injuries are, of course, most likely to occur if chordee be present, or if intercourse be attempted; but may happen when neither circumstance prevails. It is not necessary to "break the chordee" to produce them. Whenever any appreciable quantity of blood appears in a gonnorrhœal discharge, such minute traumatisms may be inferred. These slight injuries often, in my opinion, form the groundwork for future stricture building.

Relative frequency of Stricture in the various portions of the canal.—No one who has not given this subject special study can realize the difficulty of forming an accurate estimate of the relative frequency of stric-

ture in the various parts of the canal. The different standpoints of observation give widely varying results. Otis and Thompson can never be nearer together than they are to-day, unless both should accept the same standard as a criterion of stricture, and use the same methods of exploration and diagnosis. The Weir faction, with its normal points of contraction in the pendulous urethra, certainly cannot become reconciled to the teachings of Otis. I know of several excellent men with whom I have conversed, whose methods of reasoning are so widely apart that each stamps the other as an ignoramus. One begs the question by accepting the view of Otis that an urethra should take a sound of a caliber proportionate to the dimensions of the penis, and the other entirely overlooks the question at issue, by the assertion that, "that kind of strictures can be found in healthy men." I once related a case of congenital stricture in the pendulous urethra to a prominent surgeon of this city, and he asserted that the patient could not possiby have a stricture, if, as I said, he could take a thirteen English sound. I presume that there are many in the profession who would claim that a patient who can take a thirty to thirty-five French sound has no stricture. Yet a patient may take a forty French sound and the case still demand urethrotomy. Number thirty may pass smoothly an obstruction, which a number fifteen bulb will easily demonstrate.

Believing, as I do, that any point of contraction or inelasticity in the urethra, in the presence of a pathological condition of the mucous membrane constitutes a stricture, I can unhesitatingly assert my firm conviction that stricture of the urethra is most frequent in the pendulous portion of the canal. If care be taken to exclude the element of deep urethrismus—which exclusion is not as easy as some authors would have us believe—the proportion is, I think, ten to one.

That great variance of opinion exists upon this point is well known, and Bumstead and Taylor long ago called attention to the fact that there could be no harmony of results between those who studied the subject upon the living and those whose estimates were formed entirely upon observations of the cada-

ver. Folet, in 1857, called attention to the frequency of fibrous stricture in the pendulous urethra, and its comparative rarity in the bulbo membranous region. This author claimed that deep obstruction existed in all cases of stricture of the spongy portion, but that the deep structure was nearly always spasmodic and secondary to the trouble in the anterior portion of the canal. In 1866, Verneuil coolly appropriated Folet's thunder and expressed essentially the same views and in very nearly the same language. Otis, writing at a later period, while not so radical as his French predecessors, has promulgated similar views, but in a much more comprehensive and thorough manner. The relation of urethrismus to reflex irritation more or less remote as shown by Otis, is one of our most important modern contributions to the literature of genito-urinary pathology, and is decidedly complimentary to the genius of American surgery.

In estimating the frequency with which deep spasmodic stricture complicates obstruction in the pendulous urethra, an important source of fallacy exists. While a deep stricture may be demonstrated, in nearly if not all cases, by instrumentation, it does not necessarily follow that such deep strictures exist at other lines. A tender urethra resents a foreign body quite as vigorously as does the eye, and as soon as the sound touches a tender spot or sensitive stricture —even of large caliber—in the pendulous urethra, a pronounced reflex contraction is observable throughout the entire canal, which is, of course, most pronounced in the deep portion. A spasm of the pendulous portion is not usually regarded as of importance; indeed, some surgeons discredit it altogether. I have found, however, that the spongy portion often contracts so firmly about the sound that it is felt to be firmly grasped during withdrawal all along the canal. This spasm in the pendulous urethra is of great assistance in diagnosis, as it serves to force diseased portions of the canal down in front of the shoulder of bulbous instruments of a caliber much smaller than the stricture will really admit. Thus it often happens that a good-sized sound will pass by obstructions upon which quite small bulbs will catch.

In some cases deep spasm exists more or less con-

stantly; but I believe that in most of these cases there is an actual organic change at the site of the spasmodic stricture; this may be true organic deposit, an erosion, or a congested and granular patch. Under such circumstances it is often very difficult to determine, even approximately, the proportionate relation of spasm to organic lesion. Oftentimes the true condition of affairs can only be determined by subtracting the sources of reflex spasm in the anterior urethra by urethrotomy.

Reflex Neuroses from Stricture.—The remote or direct nervous disturbances incidental to stricture of the urethra are too often lost sight of in the strictly mechanical aspect of the condition. The decidedly complex relations of the genito-urinary apparatus to the sympathetic nervous system should receive more attention than is usually accorded them. Our observations of the reflex neuroses from genital irritation in children are a key to the solution of many problems in the urethral pathology of the adult. There is a general impression that a stricture is of little importance unless it produces distinct symptoms of urinary obstruction. When, however, one meets with cases of vesical atony, incontinence of urine, impotency, neuralgia of the cord and testes, lumbo-hypogastric and lumbo-sacral neuralgia, profound mental depression and other neuroses entirely and almost magically relieved by urethrotomy of strictures of large caliber, the importance of this question is brought before him in a very forcible manner. The relation of such conditions to congenital or acquired stricture at or near the meatus, is especially marked. I might relate numerous interesting cases of this character, did time permit. I have found this subject alone, extensive enough for an entire paper, which I have now in preparation for the meeting of the Southern Surgical Association in November.

Toxicæmia from Stricture.—The relation of stricture to uræmia—so-called—is not a new theme. Something might be said regarding the relation of shock from surgical operations upon the urethra to toxicæmia and consequent urethral fever, but the subject is too comprehensive for discussion here.

The relation of absorption of ptomaines from the site of the lesion in stricture—or from behind it—to the general results of stricture, is unquestionably of great importance. The rapidity with which many constitutional symptoms disappear after cure of deep strictures, is thus easily explained. Urethral chill, following instrumentation, is also explicable in the same way in some cases.

The possibility of mixed infection must be taken into consideration. The cases of cystitis, epididymitis, peri-urethral phlegmon, pyelo-nephritis and other special phenomena secondary to stricture, are not all dependent upon direct extension of inflammation, but are probably due in many cases to secondary infection. A recent case of my own is strongly suggestive in this regard. A patient whom I was treating for several irritable strictures of comparatively large caliber, developed multiple nephritic and perinephritic abscesses during the course of the treatment. An interesting point was the fact that the formation of the abscesses was heralded by great increase of irritability and spasm in the deep urethra.

The point which I desire to urge most strongly is the apparent fact that all patients with serious strictures—particularly of the deep urethra—suffer from a greater or less degree of toxæmia, and that many cases develop secondary infections of one kind or another.

That the passage of instruments may precipitate toxæmia is granted. The danger is enhanced by uncleanliness, but strictly aseptic instruments may cause trouble. It is a question, however, whether any instrument passed through a diseased anterior urethra, can be aseptic by the time it reaches the deeper portions of the canal. It is my firm conviction that strictly aseptic surgery of the urethra would demand a flushing out of the canal prior to the introduction of even an ordinary sound. This we know, is not ordinarily done, nor is it always practicable. We are, most of us, therefore, committing cardinal sins from the standpoint of aseptic surgery, as a matter of routine.

Treatment of Stricture.—The treatment of stricture of the urethra has given rise to more contention and more radically opposed views than almost any surgi-

cal disease that could be mentioned. One faction never cuts, another always cuts, and still another causes organic stricture to fade into the misty past by the use of "electrolysis" alone.

As is usually the case under such circumstances of contention, the philosophical surgeon will occupy the middle ground. The best reply that can be made to the extravagant claims of the urethrotomist and the still more extravagant claims of the electrolytic crank, is that, "there are strictures and strictures." To some of the so-called conservatists, it would be foolish to reply—the differentiation of strictures is a matter beyond their comprehension. They cling to the traditions of the past with a fatuity and obtuseness which an axe might possibly impress, but argument, never. There is a vast difference between judicious conservatism and the cowardice and ignorance that often masquerades as conservatism.

It will be impossible for me to discuss the subject of treatment in a comprehensive manner, in this paper, but, with your kind indulgence, I will attempt to present a few practical points.

Dilatation of Stricture.—By dilatation we mean gradual and intermittent dilatation. Continuous dilatation, excepting with soft instruments as a preliminary to gradual dilatation, is out of date.

Selection of Cases.—I believe that every soft and tractable stricture should be treated by dilatation. Even admitting that urethrotomy is, in many cases, a radical cure, it is far better, in my opinion, for a man to be enslaved to the sound for the rest of his days if by so doing he can avoid the dangers of an operation and at the same time receive satisfactory relief from his symptoms.

The majority of deep strictures will yield to dilatation, especially if all obstructions and points of friction and irritation be primarily removed from the pendulous portion of the canal. If such points exist, attempts at dilatation of the deep stricture only makes matters worse.

It has been my experience that strictures of the pendulous urethra are rarely soft and tractable. They are generally irritable and resilient, and the more they are stretched the worse they get, and the more

irritable the deep urethra--which is perhaps free from local disease—becomes.

It is possible to distinguish on the first examination, as a rule, those strictures of the pendulous portion which are likely to yield to dilatation. These, unfortunately, are rare. The nearer the stricture is to the meatus the less likely it is to yield to dilatation. Points of relative inelasticity will never yield to dilatation.

Frequency of Dilatation.—My experience goes to show that the majority of surgeons dilate at too frequent intervals. Here is a prime necessity for the selection of cases. Each stricture is a law unto itself. Some cases yield best to dilatation every third day. I have seen cases in which biweekly operations gave the best results. Many strictures are tortured into irritability and resiliency. A few weeks' rest sometimes obviates the necessity of urethrotomy. It is hardly necessary to repeat the old maxim that gentleness is the key-note of success in the treatment by dilatation.

Urethrotomy.—Dilating urethrotomy is the operation of election in the majority of strictures of the pendulous urethra. It is required many times as a preliminary to deep dilatation. It is absurd to attempt to dilate a deep stricture without cutting a narrow meatus, or other firm bands which may exist in the anterior urethra. Dilatation to be effective must be carried to the extreme limit of distensibility of the urethra. It is impossible to satisfactorily dilate a No. 35 bulbo-membranous region via a No. 30 meatus or pendulous urethra.

I have already called attention to friction as an important factor in stricture and gleet. A division of the inelastic and unyielding point is usually required for a cure. Oftentimes an obstruction will be due to a tender patch in the urethral mucous membrane. This causes reflex contraction, and, as a consequence, the affected spot is never at rest. Urethrotomy, however, affords the required rest, and the lesion disappears. Congested and granular plaques sometimes require the same treatment, and for similar reasons; there is, in addition, the indication for an alteration of nutrition at the diseased point.

Urethrotomy should always be performed under

strict antiseptic precautions. Instruments require as careful boiling as in the performance of a laparotomy. The urethra should be flushed out with a 1 in 2,000 bichloride solution as a preliminary measure.

Dangers of Urethrotomy.—In spite of the optimistic views of those who operate as a matter of routine, urethrotomy is attended by some inconveniences, and possible dangers. I acknowledge this frankly, and, although in an extensive experience I have had no fatalities, I confess to several scares.

I find that the general practitioner has less respect for the dignity of the operation than some specialists. It is quite common for the surgeon to operate on stricture at his office and let the patient go about as if nothing had happened, or, at most, with two or three days' confinement to the house. My opinion is that a urethrotomy properly performed is a major operation, necessitating a week's rest at least in the majority of cases. Hæmorrhage is an ever present danger.

Interference with erection and curvature of the penis are occasional results. I have seen no permanent damage of this character; but I think it occurs more often than is acknowledged by most operators. One case of my own had a double twist in the organ at the end of a year; but as he had had two operations and contracted gonorrhœa a month after the first one, and was continually drunk, his case was hardly a fair criterion.

Sepsis is usually avoidable by drawing off the urine with a soft catheter, and flushing the canal for a few days after operation.

Internal dilating urethrotomy is most applicable to the pendulous urethra. My friend, Dr. Edw. W. Palmer, of Louisville, has reported a series of cases of favorable results from deep internal section. I have followed him with half a dozen similar cases. In general, however, it is my opinion that at present external section is safest where any cutting operation is necessary in the deep urethra. A guide can usually be introduced, and the operation is then a comparatively safe one. Once in a great while a case will be met with in which a guide cannot be introduced, as in a recent case in which I performed the Wheelhouse

operation, and found a good-sized calculus behind the stricture.

The rule that traumatic strictures and all strictures complicated by extensive perineal induration and fistulæ require perineal section, is a good one to follow. The same is true of cases in which dilatation is productive of sepsis and chill. I have found in several of these cases, however, that the internal use of the oil of eucalyptus seemed to be an excellent prophylactic of chill and febrile reaction. Much more might be said upon the subject of urethrotomy, but time does not permit.

Divulsion of Stricture.—This operation, formerly so popular, is falling into desuetude among progressive American surgeons. Within certain limitations, however, it is still a useful method to fall back upon. It would seem that it ought to be the operation of necessity rather than election. In cases where time is an important consideration, divulsion is justifiable in strictures of the deep urethra; rarely, if ever, in those of the pendulous portion. In resilient strictures of large caliber, divulsion is usually impracticable.

Electrolysis.—He would be wise, indeed, who could determine the truth regarding the use of electricity in urethral stricture from the reported results which have appeared in medical literature. The changes have been rung by observers of widely different characters and degrees of credibility. The electrolytic monomaniac, the commercial electrician, the intolerant bigot, and the man who recognizes no difference between the galvanic and faradic currents, have all been heard from, with the result that many conscientious surgeons have thrown their bulbs and batteries into the dead-lumber room. It is easy to understand how Newman, the hobbyist, can claim so much for the electrolysis of stricture; it is not so easy to understand the absolute condemnation of the method by so broad and scientific a man as Keyes.

To claim such extravagant results as does the Newman school is no more absurd than to assert that the method is absolutely valueless. We must recognize the fact that the galvanic current exerts definite physiological effects upon living tissue, healthy or

morbid. Knowing these effects, and knowing the conditions present in stricture, no fair-minded man can deny the probability of definite results in practice. The term electrolysis is here, it seems to me, a very unfortunate one. The method should be termed galvanism.

I do not consider it practicable, within the limits of safety, to bring the electrolytic action of the galvanic current to bear upon a urethral stricture, with the possible exception of flaps and bands which are ingrafted upon the stricture *per se*.

We have in organic stricture several factors

1. The first and most important is a new growth of fibro-connective tissue.
2. Young cells in the process of metamorphosis into fixed connective tissue.
3. More or less œdematous infiltration.
4. Hyperæmia or congestion.
5. Spasm.
6. Flaps, bands, and bridles, due to exudate within the lumen of the canal and binding its folds together. These are often traumatic, and due to clumsy instrumentation.

Of the conditions named, only the first is essential to stricture. The other factors I will term plus conditions of stricture. These plus conditions are variable in amount and frequency, but may all be present in any given case, and may be either transitory or permanent.

When properly used, the galvanic current stimulates the circulation, stimulates the absorbents, and allays irritation and spasm. In addition we have the mechanical effect of the bulb of the electrode.

To put the case concisely, I will state my belief that galvanism, judiciously used, will often subtract the plus conditions of stricture and facilitate the penetration of otherwise surgically - impermeable stricture. Once these conditions are removed, electricity is no longer useful, and we must seek other means of relief. It may thus be seen that if these statements are true, the range of application of electricity is not wide. I do not believe it is ever curative of organic stricture, nor do I believe it is often of value in the pendulous urethra. Strictures of this

portion of the canal are very likely to require urethrotomy; certain it is, to my mind, that electricity will rarely obviate the necessity for the operation. A case of deep stricture occasionally arises where electricity will relieve retention, and so facilitate subsequent dilatation as to be invaluable, but such cases are not frequent. Surgeons may report cases of impermeable stricture in which electricity succeeded, after all else had failed, by the dozen; but there will still be those among us who believe that the man who sees so many impermeable contractions is either a paper surgeon, unworthy of belief, or his reported cases are simply impermeable to him. Impermeability of stricture upon one end of the bougie sometimes means impermeability of brain upon the other.

In thus stating what I believe to be the merits of the "electrolytic," or, more properly, the galvanic treatment of stricture, I have endeavored to present them fairly and without bias.

LECTURES ON THE TREATMENT OF SYPHILIS.*

LECTURE I.

Treatment of Syphilis.—Simplicity of local treatment of chancre.—Avoidance of caustics and ointments.—Excision of chancre.—Advantages of excision.—Supposed antidotal effect of mercury in syphilis.—Proper method of using. Power of mercury to induce fatty degeneration and elimination of morbid material.—Uniformity of all successful methods of treatment, in producing fatty degeneration.—Clevenger's theory of the mechanical action of mercury.—Probability of mercury entering the system in both mechanical and chemical conditions.—Action of mercury upon the blood.—Action varies widely under different conditions.—Action of iodine in syphilis.—When to begin the use of mercury.—Form of mercurial to be selected.—Importance of protracted treatment.—Mercury by inunction and fumigation.—Local use of mercurials.—Mercury by hypodermic injections.

GENTLEMEN:—We now come to that portion of our course, which you no doubt are much more anxious to study than the more abstruse and to you, perhaps, less practical topic of the pathology of syphilis. Remember that there is an absolute necessity for a good idea of the pathology of the disease in order that you may understand the rationale of its therapeutics.

We have studied the treatment of the primary sore in connection with the description of its pathological characters, but there are some points which will bear repetition, and others to which I have not yet alluded, but which appear to me very important. In the first place, do not forget that the chancre is to be coaxed, not driven, and that it will cause little annoyance if you give it half a chance. Use the black or yellow wash, calomel or iodoform powder, or even simple absorbent cotton as a dressing, and let the induration take care of itself. If you wish to see by contrast the results of meddlesome officiousness, try rubbing a hard chancre with nitrate of silver, and then apply some nasty, greasy ointment. You will have a fine

*Delivered at the Chicago College of Physicians and Surgeons. Reported by William Whitford.

mess of it, and a condition of affairs which I often see in patients who have been treated in this manner, by physicians, drug clerks, or very often by themselves. Avoid grease and nitrate of silver, as an abomination, if you would not lose your patients' confidence. If, as in the case of a mixed sore, it becomes necessary to cauterize, use a caustic, and have done with it, and not an irritant like nitrate of silver, which sears but does not destroy. Apply carbolic acid followed by the fuming nitric, or better still, use pure bromine or the actual cautery. The form of caustic is not so important as the manner of its use. Select your caustic early in practice, and stick to it until you know how to use it. As a last injunction instruct your patient in the matter of rest. Let him rest the affected member by avoidance of sexuality in thought or action, by taking very little exercise, and no stimulants, and lastly by handling it as little as possible. The oftener he examines himself to note the progress of the case, the worse he will eventually be. Occasionally a chancre will become phagedenic, in which event special measures of treatment become necessary, as seen in connection with phagedaenic chancroid. Free stimulation and local cauterization with the actual cautery, followed by strict antisepsis, are the principal indications. Tonics and opium must be given. Opium was specially endorsed by Ricord in phagedaenic chancre. The late Dr. F. B. Norcom, of Chicago—my lamented preceptor—used to obtain excellent results from the same remedy. I have given it for the relief of pain and nervous irritation in such cases, but have as yet arrived at no definite conclusion in regard to its possible specific effect.

There is one radical method of dealing with the chancre, which I commend to your attention, and which is often a wise thing to do. I refer to the treatment by excision. It is claimed by some advocates of this method that by it the general symptoms are modified and in some instances prevented entirely, not even the indolent glandular changes being per-

ceptible. Theoretically, if the views of the pathology of the disease which I have called to your attention, be correct, excision of the initial induration ought to prevent general infection completely, but unfortunately this has as yet to be proven to be the case in actual practice. As for myself, I am performing excision whenever the patient will consent, and am trying to arrive at a definite conclusion in regard to the matter from actual observation. I have already studied some thirty cases in this way, and have become pretty thoroughly convinced that the operation is of benefit. I have not yet omitted the administration of mercury, but am inclined to believe that excision followed by the exhibition of the drug is productive of better results on the whole than the treatment by mercury alone. In excising a chancre be careful to do so only after the induration is ripe, so to speak, i. e., after it has come to a standstill. Otherwise, induration is likely to recur in the cut edges.

There are several considerations which may be advanced, and which are in the main endorsed by Otis, in favor of the operation, in which nearly all will agree, viz.: We thereby remove a constant focus of infection, which is present as long as the induration persists. 2d. We at once remove a large mass of syphilized cells which would otherwise only be removed by the slower process of fatty degeneration, absorption and elimination. 3d. We obviate the possibility of the transmission of the disease to others by means of the initial lesion, a point of great importance to married persons. 4th. We lessen the danger of suppurating bubo, in case the chancre should inflame. 5th. We remove a constant source of irritation, and lessen the danger of phagedæna and inflammation which might disable the patient. 6th. The patient is able to resume his marital relations at once, after the incision has cicatrized perfectly. Why it is that we cannot prevent constitutional syphilis, by excision of the chancre prior to local glandular changes, is not clearly explicable, if we accept the

view that the disease is practically local primarily. It is probable that a morbid impression has been made upon the tissues by the syphilitic poison, which began the moment infection occurred, and which has extended far beyond the limits of the initial lesion before its appearance. Excision of the chancre should be preceded by washing the parts in a solution of bichloride of mercury 1–1000. The ulceration, if any exist, should then be cauterized and dusted with calomel. The chancre should now be transfixed with a tenaculum, raised from its bed, and the mass of induration quickly removed with a sharp scalpel or curved scissors. The parts should be sutured with fine catgut or silk, and the parts kept at rest for a few days with cold water dressings. Within forty-eight hours, as a rule, the wound will have united and the stitches may be removed. In a few days, if no lesion be present, the patient may resume his marital relations.

The constitutional treatment of syphilis is naturally a subject of paramount importance. Errors more serious in their effects than the disease itself are often committed by those whose practice is not founded upon a sound pathological basis. The disease has long been treated upon the principle that there is present a constitutional poison, which must be antidoted, and mercury has appeared to be the antidote. Hutchinson has taught that this drug has the property of neutralizing the specific virus upon which syphilis is supposed to depend. This theory of the antidotal effect of mercury has been accepted by some of our best syphilographers. They, however, in thus accepting the antidotal doctrine, have seemed to consider it all-sufficient, and have failed to explain the physiological action of the drug, and have given it solely because experience has proven that it is curative in syphilis. Now, we find that even when the system has been completely saturated with mercury, even to the extent of producing severe ptyalism, the disease returns directly the drug is withdrawn, thus

showing that the syphilis has in no sense been antidoted. On the contrary, the case is usually worse than ever. *On the other hand, we find that the slow, continuous and moderate use of mercury, for a period corresponding to the maximum time of the normal duration of the disease as nearly as may be, and without at any time producing its full physiological effects, will bring about a cure, which can be accomplished in no other way.*

It is well known that mercury has the power of inducing fatty degeneration and elimination of inflammatory products, or in other words, "of relieving tissues encumbered with superfluous and obstructive material." This condition of the tissues is precisely what we have in syphilis, and as mercury is the best remedy we have for such a pathological state, irrespective of causation, we administer it throughout the natural course of the disease, *not to antidote a poison, but to remove the morbid results produced by it, as fast as they are formed, until finally the syphilitic impression upon the organism has naturally exhausted itself.* We have already seen that the "virus" of syphilis is not a material substance, but practically consists in an influence which a degraded cell has over another which is healthy, causing rapid proliferation and obstructive accumulation of the cells so influenced. It is a rather peculiar fact, that every method of treatment for syphilis that has been advocated for the last two or three centuries has comprised such measures as tend to produce rapid tissue change. The sweating cure, the use of hot baths as at the Hot Springs of Arkansas, the purgation and starvation cures, Boeck's method of syphilization, and the treatment by pustulation with tarter emetic, all of which have been recommended by various authorities at different times, are chiefly active through their power of inducing fatty changes in the tissues.

The action of mercury upon the system has been the subject of considerable controversy, particularly as regards the form in which it enters the blood. A very ingenious theory was promulgated a few years

ago by Prof. S. V. Clevenger, of Chicago. This gentleman has endeavored to show that mercury does not enter the system as a chemical compound, but as metallic mercury in an exceedingly fine state of subdivision, and that it acts upon disease—particularly syphilis—in a purely mechanical manner, by pushing the syphilized cells through the fine capillaries, and eventually into the various eliminative areas of the body, from which they are removed as is other excrementitious matter.

Clevenger has found by examination of the tissues after the use of mercury by inunction, that they are filled with minute globules of the metal, thus showing that it does, in that instance at least, enter the blood in a state of fine subdivision. Another argument is the fact that free mercury is to be found in the tissues of patients who have been taking the drug for some time.

The prevailing view has been that mercury enters the system as a chemical compound, and brings about an antidotal effect, or produces a fatty metamorphosis of the diseased cells.

My own idea is that mercury may enter the blood in either form. When it enters as a chemical compound, it may split up so as to liberate a certain amount of the pure metal, or entering as metallic mercury it may undergo chemical changes in the tissues, these effects varying in different cases. Certain it is that finely subdivided mercury introduced into the great physiological chemical laboratory of the body is quite likely to undergo chemical changes. Should it be demonstrated that mercury cannot exist in the body as a chemical compound, and that it cannot act in any but a mechanical manner, I should still be inclined to doubt its alleged ferret-like properties of chasing and pushing the diseased cells out of the back doors and chimneys of the economy, and should be inclined to believe that it acted by blocking up the vessels leading to the syphilitic neoplasia, and thus enhancing their own intrinsic tendency to fatty

degeneration. Practically, I am firmly convinced that the drug acts by inducing fatty degeneration, but whether by a mechanical or chemical action, or by a combination of both—which is highly probable—does not seem to be of any great moment.

The action of mercury upon the blood is of great practical interest, inasmuch as by its use two diametrically opposite effects may be produced, according to: 1st. The dose used; 2d. The duration of its administration; 3d. The constitutional condition of the patient; and 4th, the stage of the disease. If the drug be given in full doses for a few days, or in frequently repeated small doses for twenty-four to thirty-six hours, severe stomatitis and ptyalism may be produced. If it be given in a less vigorous fashion for a longer period, we may have pallor and debility, due to a depreciation in the quantity and quality of the red blood corpuscles, to defibrination of the blood plasma and increased tissue waste. A certain degree of these effects is necessary in the treatment of syphilis, but it is our chief aim to keep them within bounds, and to avoid the danger of producing permanently injurious effects. Such effects as great pallor, wasting and debility, pustular or vesicular eruptions with fever known as the "mercurial fever," and marked tremors, may result from the action of mercury, and that, too, without the occurrence of ptyalism. On the other hand, small doses of mercury, in various cachectic or anæmic conditions, particularly during the sequelæ of syphilis, will rapidly and markedly increase the quantity and improve the quality of the red corpuscles and fibrine. thus lessening hydræmia. This statement is based upon the experiments of Prof. Keyes with the hæmatometer, and, moreover, upon personal observation of the action of the drug. The question of the possible accumulation and prolonged retention of mercury in the system is as yet subjudice, the weight of evidence being apparently in favor of the view that proofs of such a result of the drug are wanting. I

I have not yet seen any of those cases in which portions of bone are found to be "full of metallic mercury." That metallic mercury may be found in the tissues during a prolonged and thorough course of mercury is true, but that such a condition prevails for years after the treatment, I most emphatically do not believe. Alleged cases of this character have probably been under more recent mercurial treatment than they acknowledge or than they are aware. They may have been innocently taking medicines of mercurial composition.

In a series of elaborate experiments by Dr. Schuster, of Aix-la-Chapelle, has shown that the elimination of mercury by the fæces is by no means inconsiderable.* The method of administration was by inunction. Some of this eminent authority's conclusions are of interest. He concludes :

"1. That elimination of mercury by the fæces is regular and continuous.

"2. That elimination after thirty to forty-five days of mercurial inunction is complete in six months.

"That, consequently, persistence of mercury in the organism cannot occur.

"This conclusion is important as bearing upon the cumulative action of mercury."

There is another remedy which experience has shown to be curative in syphilis, and which is second only to mercury. I refer to iodine, which in the form of the iodides is exceedingly useful, especially in late syphilis. The iodides—of which potassic iodide is the type—act in two ways in the cure of syphilis : viz., first, by their own intrinsic power of producing fatty degeneration, and elimination of morbid products; and second, by liberating and exciting to renewed activity the mercury which may be stored up in the tissues, thus assisting its action. It is evident that the first of these effects is the most important, for the iodides have a most powerful effect in resolving the products of inflammatory changes, or of

* Journal of Cutaneous and Venereal Diseases, Sept., 1883.

adventitious deposits, irrespective of their cause. I make this assertion in the face of the argument that iodine can cure syphilis only by liberating mercury from the tissues, and that it is the mercury and not the iodides that produces the curative effects. That this is incorrect is shown by the beneficial effects of iodide of potassium in cases of late syphilis in which mercury has never been administered.*

Having decided upon the administration of mercury in the constitutional management of syphilis, when shall we begin its use? It is claimed by some that it is not good practice to begin treatment until the secondary symptoms develop, until, in short, the case is matured, as mercury will have little effect prior to that time. Now I believe that it is our duty to begin treatment just as soon as we are positive of the diagnosis, as we thereby shorten the duration of the initial lesion, and modify or even prevent secondary symptoms. To save the patient from lesions upon the body or face, which "he who runs may read," is very desirable, and is only to be accomplished by early treatment. It must be acknowledged, however, that those cases in which treatment is not begun until pronounced eruptions appear, sometimes seem to respond more readily to therapeutic measures, and to give rather less annoyance during the active period than those in which mercury is given as soon as the chancre develops. Whether the prospect of a permanent cure is brighter, is questionable. Under the caption "When to begin the treatment of Syphilis?" my friend Dr. Dumesnil, in the St. Louis Medical Journal for August, 1885, opposed very strongly the practice of giving mercurials before secondary eruptions appear, no matter how plainly marked the case. The difficulty of diagnosis is one of the most powerful arguments advanced, and is presented so clearly and forcibly that one can hardly offer a criticism. There are, however, some cases which are so plainly marked

* In the British and Foreign Medical Review for Oct., 1845, Hassing of Copenhagen, reported 195 cases of syphilis, 70 of which were cured by the iodide of potassium alone, without mercury at any stage.

that this argument falls to the ground. In quite a proportion of cases the conscientious physician must necessarily wait, and regarding such dubious cases there should be no difference of opinion. Dr. Dumesnil further claims that by the administration of mercury secondary symptoms are not prevented, they are merely delayed. Now this statement is rather too comprehensive. It is true that secondary symptoms are rarely prevented entirely, but are they not usually markedly modified? What is to be said, moreover, in regard to those cases in which no symptoms whatever follow the primary sore until, perhaps years after the disease was forgotten, severe sequelæ appear. According to Dumesnil, the non-appearance of secondary symptoms would indicate that in such cases syphilis did not exist. In some cases secondary symptoms are very slight, and apt to be overlooked by the patient. In such cases the necessity for constitutional treatment might be first announced by severe sequelæ at a period too late to hope for a permanent cure. I think from personal experience that in doubtful cases delay, as suggested by Fournier, is most proper, but, on the other hand, that whenever an unequivocal diagnosis can be made, treatment should be begun at once.

Having determined upon the administration of mercury, it remains to select an eligible preparation. The mildest and least irritating form of the drug, is the protiodide, or as it is sometimes termed, the green iodide. It is best given in pill form, in doses of one the average, one-fifth of a grain, thrice daily. This dose is to be continued for several days, and then increased one pill per day until the gums become somewhat tender, or the stomach and bowels are disturbed. I generally give the drug until the gums are slightly effected, and then gradually lessen the dose until the patient is taking about half the amount necessary to produce slight physiological effects. This, as Dr. Keyes terms it, is the patient's average dose, and is usually from two to four pills of

the strength mentioned, daily. It is generally continued throughout the course of treatment. It is well to bear in mind the possibility of injurious effects from the cumulative action of the drug, and also the fact that it is apt to less its effect upon the disease after a time. A good plan is to omit the protiodide at intervals of two or three months, and give potassic iodide pretty freely for about four weeks. In this way any mercury which may be stored up in the tissues, is liberated, rendered active and eliminated, and the system again rendered susceptible to its action by the time the pills are resumed. By proceeding in this manner, you will always avoid the possibility of injuring your patient with mercury. There are various other forms of mercury which are considered eligible by different practitioners. The bicyanide has been known to agree when all other preparations were not tolerated. The red iodide has been especially recommended in the late scaly eruptions. A well-known preparation called Zittman's decoction, was formerly much used in Germany. It contains mercury in combination with sarsaparilla and aromatics.

It is always a matter of great difficulty to induce our patients to take medicine for a sufficient length of time to effect a cure. They are prone to find fault with us if we are honest with them, and to suspect us of sordid motives if we attempt to coerce them into prolonged treatment. It is a solemn fact, gentlemen, that people try desperately to compel the physician to be dishonest. They mistake honesty for lack of skill, and will more readily pay the quacks huge fees for false promises and blatant pretenses, than the scientific physician a moderate amount for skillful treatment. They have always at their tongue's end a long list of their friends who were cured of a bad case of syphilis (?) by Dr. So-and-So, in three months. In spite of this perverseness of human nature, however, it is our duty to tell your patient that if he wants to get well, he must take medicine for at least two years, and if any doubt exists at the

end of that time he had better add another year, especially if he has matrimonial intentions. Allow no syphilitic patient to marry under three years from the appearance of the chancre, if you would have clear consciences.

Another difficult item in the management of most cases of syphilis, is convincing the patient that it is absolutely necessary for him to avoid the use of liquor and tobacco for an extended period, and that he must abstain from the various dissipations and excesses to which he has been accustomed. The point must be insisted upon, however, and with good conduct upon the part of the patient assured, half the battle will have been gained. The late Willard Parker used to say to his syphilitic patients, "You are possessed of three devils, rum, tobacco and syphilis. If you will rid yourself of the two former, I will rid you of the latter."

In some cases you will find that your patient does not tolerate mercury well, and that a diarrhœa or gastric disturbance follows the slightest attempt to crowd the drug. In this event, one-eighth grain of ext. hyoscyamus should be added to each pill. A good plan too, is to give the patient a few five grain powders of bismuth subnitrate, with instructions to take one whenever the stomach or bowels become troublesome. In other cases, the patient will stand a large amount of mercury, and I have repeatedly given several grains of the protiodide daily for some weeks, without effecting the gums or the digestive tract in the slightest degree. In such cases the large doses should be kept up for a few weeks, and then diminished to about four or five pills daily. In some cases you will find the pil. duo. introduced by Dr. Bumstead to be an excellent preparation, especially when the patient is anæmic and debilitated. The pil. duo. contains gr. ii. of pil. hydrarg. and gr. i of ferri sulph. exsiccat. It should be given precisely like the protiodide. It usually produces constipation, hence an occasional dose of hunyadi or bitter water may be necessary.

When a patient fails to respond readily to the internal administration of mercury, or when gastro-intestinal irritation is marked, the drug may be used by inunction. The oleate is the best preparation, although too expensive for some patients. The twenty per cent. solution should be used, and about 3i rubbed into the axillæ morning and night. As the axillæ become irratated, the rubbing may be done at the flexures of the joints, where the skin is thin and absorption readily occurs. The mercurial ointment, though less elegant, may be used as a substitute for the oleate. It may be rubbed in, or spread upon a white flannel band in contact with the abdomen, the band being shifted about occasionally and the skin kept clean by daily washing. Another good plan in hospital practice, is to rub the ointment upon the soles of the feet, and have the patient wear heavy woolen socks.

In some cases inunctions or baths must be wholly depended upon, and it may be said in this connection, that they are very efficacious in obstinate skin lesions. Frictions of the oleate are useful in rupia, and will also assist in removing the induration of the primary sore unless ulceration exists, in which case it produces irritation.

A simple method of giving a mercurial bath, is as follows: A small tin plate supported by a tripod, an alcohol lamp, and a pan of boiling water, are all that is necessary. The patient being stripped, seats himself in a cane bottomed chair, and wraps the chair and his body thoroughly in blankets. About twenty grains of the mercurous chloride is placed under the chair. In a few minutes the calomel is vaporized, and with the steam from the boiling water, is deposited upon the skin of the patient. In fifteen minutes the lamp may be extinguished, and after ten minutes more, the patient should wrap himself in a dry blanket and go to bed. In the morning he may rub himself with dry towels, the mercury having become in great part absorbed. About three baths per week are necessary. Calomel is the best preparation

for fumigation, because of its freedom from irritating properties, and the readiness with which it volatilizes without reduction to the metallic condition. The red oxide also volatilizes readily, but its fumes are more irritating to the respiratory tract.

It is sometimes necessary to bring a patient under the influence of mercury very rapidly, e. g., in cases of syphilitic iritis, in which a few hours delay might be fatal to the integrity of the eyes. In such an event calomel in doses of $\frac{1}{12}$ gr. every hour. will accomplish the desired result; and if necessary, ptyalism can be produced in this manner within twenty-four to forty-eight hours. Another method of rapid and efficacious introduction of mercury is by Lewin's method of hypodermic injection.* From $\frac{1}{16}$ to $\frac{1}{8}$ of a grain of the bichloride, in combination with $\frac{1}{30}$ gr. of morphia and a small quantity of sodium chloride, are dissolved in fifteen minims of distilled water, and injected into the cellular tissue, preferably of the back, once or twice daily.† There is a vast difference in the susceptibility of different patients to these injections. I have never seen an abscess produced by them, but some patients complain bitterly of the pain following their administration. In others, hard and painful indurations follow their use. If the precaution is taken, however, of introducing the needle well into the cellular tissue before injecting the fluid, very little trouble will be caused in the majority of cases. It is probably the best treatment for syphilis, in a large number of cases, if you can get your patients to attend strictly to treatment. As an adjunct to internal treatment, the injections are excellent, and I am at present giving them in most of my cases. There is one point to which I desire to call attention, viz.: the bichloride makes the needle very brittle, and unless you change it frequently, you are quite likely to break it off in the tissues, an accident which the patient is quite liable to criticise. For the average patient in the hands of

* Lewin, "Behandlung der Syphilis, mit Subcutaner Sublimat—injection," Berlin, 1869.

† Stern, Progres Medicale, Paris, 1878.

the general practitioner, it is probable that Lewin's method is inferior to the internal use of the mild iodide. Abadie urges the advantages of his method of subcutaneous injections of mercuric bichloride in the late ocular lesions of acquired syphilis and constitutional syphilis. "These lesions are characterized by their complex nature and the slowness of their evolution. Choro-retinitis is frequently accompanied by chronic iritis, and even by parenchymatous keratitis. Many of these cases heal spontaneously without treatment, while others show a very disquieting tenacity, which resists all treatment until the hypodermic mercurial injections are employed. This latter method of treatment gives good results also in certain forms of chorio-retinitis limited to the region of the macula. In cases of isolated paralysis of the cranial nerves or twigs of nerves, without cerebral complications, the extreme rebelliousness of the trouble is successfully conquered by the hypodermic method of treatment." For this purpose Abadie employs a solution of mercuric bichloride, 1 part; sodium chloride, 2 parts; and distilled water, 108 parts. He injects on alternate days, 20 drops of the solution beneath the skin of the back, and makes gentle massage over the spot afterward.*

An interesting method is the treatment of syphilis by intramuscular injections of mercury. Mr. J. Astley Bloxam states that over fifteen hundred patients have been treated by this method at the Lock Hospital and elsewhere during the past eighteen months, with the best results. "The solution for injection contains 6 grains of the bichloride to the ounce of distilled water, and of this 20 drops constitute a dose. The sore generally begins to heal very promptly after one or two injections; the secondary symptoms are markedly modified, and after a course of treatment extending over a year, more or less, the patient is enabled to discontinue his attendance. Toward the latter end of the course of treatment the injections may be given

* Abadie, Annales d' Oculist, May–June, 1886.

less frequently, and, as a rule, not more than from 8 to 12 grains of the perchloride are injected in all. It is undesirable to repeat the injections oftener than once a week, as otherwise salivation might be induced, and the quantity injected each time (⅓ of a grain) is found to be quite sufficient until the next time. There are several advantages attending this method of exhibiting mercury. In the first instance, it is only necessary to see the patient once a week, when sufficient mercury is injected to last until the following week; secondly, salivation is not produced, as was apt to happen when the patient continued to take mercury for a whole week away from the supervision of his medical attendant; thirdly, the gastric derangements which are so apt to follow the administration of mercury by the mouth are by this means avoided; lastly, the ease and certainty of the administration which enable the surgeon to do his own dispensing with a minimum of trouble. A little quinine is generally given during the course as a tonic, but no other form of mercury is administered. The injections are made preferably deep into the muscular mass of the glutei; the pain following is slight and soon passes away, and there is no danger of an abscess.*

In the case of females with very weak stomachs, or in infantile syphilis, the gray powder or hydrarg. cum creta is an excellent mercurial preparation. If you have to crowd the mercurial, do so by superadding fumigations or inunctions, rather than by increasing the internal dose. A preparation recently extolled abroad is the tannate of mercury, which is claimed to be perfectly unirritating. The hydrargyrum formidatum is also serviceable. The peptonate is another fanciful preparation used by our French confreres. At the next lecture, gentlemen, we will give our attention to the evil effects of mercury.

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*New York Medical Journal, October 23, 1886.

LECTURES ON THE TREATMENT OF SYPHILIS.

LECTURE II.

Necessity for appreciating the evil effects of mercury when improperly given.—Prejudice against its use.—Depression from mercury.—Mercurial ptyalism and stomatitis.—Care of the teeth during a mercurial course, to prevent ptyalism.—Causes of salivation.—Treatment of salivation and stomatitis.—Rheumatoid pains as an indication of excessive use of mercury.—Pain in the heels and soles of the feet from mercury.—Possibility of some of the alleged late lesions being due to mercury.—Action of iodine preparations.—Iodides in precocious syphilis.—Methods of using iodine and its preparations.—Large doses of the iodides in destructive and nervous lesions.—Unpleasant and injurious effects of the iodides in excessive doses.—Iodism and its treatment.—Iodine eruptions.—Tendency to the use of questionable preparations in syphilis.—Mistura alterans, (McDade's), Tayuga, Potassium bichromate, Coca, Iodoform and iron.—Local management of certain syphilitic lesions.—Necrosis of bones in late syphilis.

GENTLEMEN:—There is a strong tendency upon the part of most teachers upon the subject of therapeutics to speak only of the good effects which are claimed to result from the administration of various drugs, and to avoid the discussion of those evil consequences which are likely to occur at the hands of the inexperienced or careless practitioner—and for that matter, at the hands of the most competent men. This I believe to be wrong, and I will therefore state with reference to mercury, that it is a drug which must be used with great circumspection. You will meet with a very firm and it must be confessed, fairly well grounded prejudice against its use existing in the minds of the laity. We must, of course, take into consideration the fact that many of the alleged evil results of mercury are due to the circumstance that its use has not been faithfully persisted in for a sufficient length of time, but with all this, there is undoubtedly a certain proportion of cases in which serious injury to the system of the patient may be justly laid at the

*Delivered at the Chicago College of Physicians and Surgeons. Reported by William Whitford.

door attributed to this remedy. With proper care, however, I venture to assert that there is no drug which is safer or more reliable, and I have yet to see a single case of permanent injury resulting from the drug, when properly used.

We occasionally meet with cases in which mercury has a very unsalutary effect upon the patient, in the form of intense mental and emotional depression, even when very moderate doses are given. In such cases it may be necessary to give tonics and even stimulants, in order to counteract this condition. Or it may even be necessary to stop the mercury entirely, and depend upon potassium iodide. Coca will be found useful in such cases.

One of the most frequent of the injurious effects produced by mercury is ptyalism. Salivation in any marked degree is always injurious, and no more pronounced effect should ever be produced than a slight redness and tenderness of the gums, with a slight increase in the salivary secretion, a coppery taste in the mouth, and,—what is often a good indication to diminish the amount of mercury,—a sensation as if the teeth were too long. To this latter symptom I desire to call especial attention. Ulceration of the cheeks or gums sometimes occurs without previous salivation, but this is quite rare. To prevent these annoyances, the mouth and teeth ought to be put in thorough order by the dentist prior to beginning treatment. Tartar should be removed and the teeth cleaned, and all those which are decayed either extracted or filled.

The causes of salivation are iodiosyncrasy or renal inactivity with moderate doses of mercury, or large doses without iodiosyncrasy. Diseases of the mouth and gums predispose to it, and sometimes exposure to cold and wet during a mercurial course will bring it on. The elimination of mercury from the system, being chiefly through the medium of the kidneys, we may best guard against ptyalism and other cumulative evil effects of the drug by the administration of diur-

etics and the use of hot baths. Ptyalism will not be apt to occur as long as the kidneys are not inhibited in the performance of their eliminative function. Iodide of potassium assists in the elimination of mercury, chiefly through its stimulating action upon renal secrection. Exposure to cold and wet during a mercurial course causes ptyalism, through the reflex hyperaemia and consequent inhibition of function of the kidneys incident to a severe cold. Under such circumstances, jaborandi is our most rational remedy. When salivation occurs, it requires treatment. Of course the first thing to do is to stop the mercurial. The chlorate of potassium may be given internally, and a mouth wash used composed of the chloride of potassium and tincture of myrrh, in the proportion of ℥ i. of the potass. chloride and ℥ i. of tr. of myrrh to ℥ iv. of water. Glycerine may be added if desired. Remember to specify the chloride of potassium and not the chlorate, in this mixture. In some severe cases of salivation the patient cannot swallow solid food, and whether this be the case or not fluid aliment is indicated. As already indicated, the skin and kidneys require attention. Relieve the strain upon the kidneys by the Turkish bath and jaborandi, and at the same time flush out the kidneys by copious draughts of hot water in combination with the citrate of potassium. It is not wise to give the iodide of potassium at first, as it may enhance the difficulty by liberating still more mercury which has become stored up in the system. As the case improves, it may be given with great benefit. I hope that you may see a case of mercurial salivation sometime in the practice of someone else, as a sort of warning to you regarding the abuse of a really excellent drug. The fetor of the breath in these cases is something horrible, and is due to the presence of decomposing fat in the saliva, produced by the action of mercury upon the tissues, and eliminated by the salivary glands. In some cases of mercurial stomatitis, the cheeks, tongue and lips are fearfully swollen, perhaps ulcerated, and covered

with a yellowish pultaceous deposit, which is eminently characteristic.

You will find in certain instances chronic pains of a rheumatic character, muscular and articular, resulting from mercury, and I have learned by experience that when a patient who is taking much mercury begins to complain of vague pains in the forearms and legs, it is time to drop mercury and give iodine. There is one peculiar fact which is worthy of mention, and that is that some patients complain bitterly of pain in the heels and sometimes the soles of the feet, similar to that which occurs in gonorrhœal rheumatism. This is probably due to mercury. When your patient complains of his feet being tender, lessen the amount of mercury and give the iodides, if you would save yourself trouble. There is a serious question in my mind whether some of the ulcerations of the mouth and tongue in the later periods of syphilis may not be due to mercury. I see many such cases in which the continued use of the drug appears to make matters worse, and I find that when iodides are substituted improvement at once occurs. This might be attributed to the action of the iodine in liberating and revivifying, so to speak, the latent mercury, but I doubt it being the correct explanation. We occasionally meet with cases of syphilis in practice that will put us at our wit's end for suitable remedies. One of my patients is a case in point. The case is that of a lady aged twenty-six, who has been suffering from an attack of syphilis for the last year. She has gone through successive eruptions, with their concomitant lesions, while under active treatment. Thus she has had the roseola, followed by a papulo-squamous syphilide with mucous patches of a severe type, a tuberculo-squamous eruption followed by ulcerations, and accompanied by condylomata and two attacks of iritis. Now I am positive that this patient is made worse by mercury, but her stomach is so irritable that iodides are not tolerated for any length of time, and I am forced to rely for the most part upon tonics, coca having acted best of any which have been tried.

The use of the iodides in syphilis requires some special notice. The active element in the iodides is supposed to be the free iodine which is liberated in the system, but there seems to be some difference in the degree of effect exerted by the various salts. The potassic iodide is the most powerful, but is most liable to produce gastro-intestinal irritation. This does not, however, impair its usefulness to any great extent, for it is the most generally used of all the preparations of iodine. The sodic salt is milder, and is a useful substitute for the potassic iodide, where the patient has a feeble or irritable digestive apparatus. The iodides are often and successfully used in combination, the ammonium iodide being combined with the iodides of potassium and sodium. Pure iodine is useful, but usually too irritating.

It is the custom with most practitioners to use iodine and its preparations only in the late periods of the disease, and chiefly in tertiary lesions, but it will be found that many cases of obstinate secondary lesions will not yield until the iodides are given. As I have already stated, it is well to give a few weeks' course of the iodides from time to time throughout the course of mercurial treatment. A small amount of the biniodide may be given at the same time if thought best. In cases of precocious syphilis, in which destructive lesions or nervous changes come on early in the disease, the iodides are our chief reliance. It is in late syphilis, however, that the iodides will be found most reliable, especially if combined with mercury in the form of "mixed treatment." Gummy lesions require an excess of the iodides, but in all cases, after the serious lesions are under control, a prolonged mild mercurial course should be instituted. This is the proper method of treating the deeper lesions of the brain, spinal cord, bones, viscera, testicle, etc., the tubercular lesions of various kinds, the various scaly eruptions, and those later syphilides which tend to aggregate themselves in groups, or to become particularly obstinate. As an example of the

formulæ for the mixed treatment, I will give you a quite popular combination:

℞ Hydrarg. bichlor..... gr. iv
Ammon. iod..... ℥ iii
Kalii iod..... ℥ vii
Tr. Cinchon. Co. or Syr. Sarsap. Co.. ℥ iv
M. Sig.—℥ ii. in wineglassful of water after each meal.

Where it is desirable to use an alterative tonic in combination, I frequently give the elixir of the three chlorides. This is a very reliable and elegant mixture prepared by Renz & Henry, of Louisville. It is not a quack or secret remedy, nor is it recommended as a cure-all, and I have no hesitancy in endorsing it. I might remark, by the way, that I seldom endorse special preparations, but I do feel at liberty to endorse some of our modern therapeutical elegancies, the formulæ of which are known. The formula for the elixir of the three chlorides is as follows:

℞ Proto-chloride of iron..... gr. 1/8
Bichloride of mercury ..... gr. 1/16
Chloride of arsenic..... gr. 1/60
Calisaya alkaloids and aromatics q. s.
M.

A desirable formula is as follows:

℞ Kalii iod..... ℥ ii vii
Ammon. chloridi..... ℥ ii vii
Elix. Chlorides Co. (R. and H.)... ℥ iv
M. Sig.—℥ i to ℥ ii after each meal.

When it is necessary to stop active treatment I frequently give a tonic course of the elixir of the chlorides alone.

The late Prof. Gunn's "three-eights" mixture is an excellent one for the administration of iodine. It is as follows:

℞ Iodinii Resubl ..... gr. viii
Potass. iodidi..... ℥ viii
Syr. Sarsap. Co..... ℥ viii
M. Sig.—℥ i dose.

Always instruct your patients to dilute these preparations well before taking, as they are all more or less irritating to the stomach, and, as far as possible, to take them after meals. In some instances, however, in which the patient's digestive organs are not very sensitive, the iodides may be taken with advantage while fasting, especially if combined with a vegetable bitter, like quassia or cinchona. In the formulæ which I have given you for the mixed treatment, you are likely to criticise the combination of incompatibles and the administration of the irritating bichloride, but if you reflect you will see that the ingredients are rationally compatible, although not chemically so. We have a chemical reaction in the mixture, which results in the formation of the biniodide, which is very active by virtue of its being in the nascent condition. When it is neeessary to push the dose of the iodides, do so by adding a saturated solution of sodic or potassic iodide, to be taken in doses of five drops thrice daily to begin with, and to be subsequently increased one drop daily at each dose, until the limit of tolerance has been reached, or until the symptoms yield, when the dose may be reduced, the favorable result meanwhile continuing. It is sometimes necessary to use mercurial inunctions in addition to the iodides, and the local application of the oleate sometimes assists in the cure of the lesions amazingly.

The deep-seated ulcerations,—especically those of the throat,—syphilis of the bones, and syphilis of the brain and cord, often require enormous doses of the iodides before they exhibit any signs of yielding. In the venereal wards of the New York Charity Hospital, a daily dose of two or three hundred grains of potassic iodid was nothing unusual, and Van Buren relates a case in which nine hundred grains were given daily for eleven days. In my own service we had several cases in which the drug was increased to a daily allowance of four hundred grains. I must acknowledge, however, that I was never fully satisfied as to the purity of our hospital drug, and Van Buren himself told

me that he did not believe it possible for a patient to tolerate the amount of iodide which we so commonly gave at the hospital, if the drug were pure. It would seem that a patient's kidney's would be rather worthless, after eleven days work at the daily elimination of two ounces of the iodide. Making due allowance for adulteration however, the doses which some patients will tolerate are amazing. I have several patients who have taken three hundred grains daily for two to three weeks, and I am certain that the drug was perfectly pure. On the other hand we meet with cases which will not tolerate even small doses of the iodides. The tolerance of potassium iodide exhibited by different patients, greatly depends upon the general common sense management of the constitutional condition. The iodides will produce great debility and wasting when given in large doses, unless great care be used. Nearly all cases of late syphilis are suffering with two things, viz: the debility produced by long continued syphilis, and the pallor and anæmia incident to injudicious mercurial treatment. Great care is always necessary in such cases to keep up general nutrition. If the syphilis per se, be repeated, injury is apt to be done, but if the syphilis be relegated to the back ground, and the patient himself attended to, much good may be accomplished. Many patients who have sequelæ of syphilis and who have taken more or less mercury in time past, will tell you that they "cannot stand mercury." To such patients you may safely say that they not only can stand mercury, but that they can take it and grow fat at the same time. Mercury produces effects which vary greatly according to the idiosyncrasy and resisting power of the patient, and the dose, preparations and method of administration of the drug. Given in minute doses in combination with the iodide, it acts as a powerful tonic. The proper method of administration of the iodides, is in the form of the saturated solution, as above designated. At the same time, the formula for the mixed treatment with a dose of the bichloride not to exceed 1-32 of a grain should be

given. Cod liver oil and iron are always necessary in these cases. The oil may be given as an emulsion, and the iron in the form of the diolysed or syrup of the iodide. An illustrative of the excellent effects of this method or management the following cases from my note book may be of interest, although in no sense remarkable.

Case 1. A physician of thirty-five contracted syphilis at the age of twenty-eight, and went through a more than ordinarily severe course of the disease. Two years after the commencement of his trouble. extensive ulcerations appeared upon his right leg, and as the veins of this limb were varicose, the lesions proved very obstinate, and up to the time of his consulting me had never been perfectly healed. In the mean time the patient had become thoroughly disgusted with mercury on account of injudicious treatment early in his case. At the time I first saw him, debility was quite marked. Potassium iodide in increasing doses, and 1–32 of a grain of the bichloride were ordered, and later on, a mixture of syr. ferri iod. and ol. morrhuæ. Antiseptic strapping constituted the local treatment. The oil and iron were ordered in sherry wine after meals, and the patient was as much surprised as he was gratified at this prescription,—which by the way is always useful in these chronic cases. Improvement was quite rapid, and the patient gained fourteen pounds in about four weeks, the ulcer meanwhile cicatrizing completely.

Case 2. A lady of thirty consulted me in regard to necrosis of the palate, nasal and superior maxillary bones. I removed small portions of necrosee bone from time to time, and advised tonic doses of mercury with increasing doses of the iodide, in combination with oil and iron. Although she was much debilitated, I increased the dose of iodide until the patient was taking one hundred and eighty grains per diem, and with the best results. The nose and throat improved, the necrosis ceased, and the patient gained about twelve pounds in the course of a month.

Case 3. This case was that of a gentleman of thirty-three, who had lesions of the nose and pharynx similar to those of case 2. Anæmia was not marked, but wasting was quite pronounced. The patient stated that he could not take potassium as it disturbed his stomach and made him grow thin. Under the usual routine treatment which I have recommended, this patient was finally given nearly two hundred grains of potassic iodide daily, for at least two weeks. At the end of three weeks treatment he had gained seventeen pounds in weight, and was correspondingly happy. At the end of six weeks this patient went home in better health than at any time since he contracted his syphilis.

I might describe a number of similar cases from my private practice, but I think that the three histories which have been given you are a fair illustration of what judicious treatment can do, and consequently of much value as a dozen would be to you.

Like the unpleasant effect of mercury, those of iodine require more than casual attention. In the first place, the iodides may cause sudden and severe ptyalism in patients who have been taking mercury freely, simply by suddenly liberating and rendering active the latter drug. On this account, caution should be exercised in the use of the iodides in such cases as have been under a prolonged course of mercurials. You will find in every case, that the iodine has a special action upon the salivary glands, whether the patient has been taking mercury or not. If you will take a ten grain dose of the iodide of potassium, you will find that you can taste the iodine most distinctly in a very short time, and that your saliva, and the mucus from your nasal passages, will exhibit a decidedly yellowish tinge. The nasal mucus especially, will be greatly increased in amount.

The most important of the evils which may be caused by the iodides is the condition known as "iodism." This consists in a feeling of depression and malaise, nervous irritability, tinnitus aurium,

neuralgic or rheumatic pains in various situations, especially in the bones and muscles, and irritation of the various mucous surfaces, especially those of the eyes and nose. The latter symptom may be merely a mild coryza or may amount to a very severe inflammatory œdema of the conjunctiva, nasal and lachrymal apparatuses. Severe diarrhœa and vomiting, with severe griping pain, may occur from the irritant action of the drug, and may necessitate its complete suspension for a time. Often, however, the treatment may be continued by substituting the sodium for the potassium salt, limiting the diet to rice and milk, and giving large doses of the subnitrate of bismuth. When given as I have already suggested, by beginning with small doses and gradually increasing until the limit of tolerance is reached, there is usually little difficulty in administering large doses of the iodides.

Eruptions of the skin are liable to occur from the iodides, and some patients appear to have an idiosyncrasy which renders them peculiarly liable to the occurrence of eruptive phenomena, even when quite small doses are given. I have a patient at the present time who cannot take the iodide in ten grain doses for a day without the development of red painful swellings upon his limbs. In the same way we find patients who are liable to extreme iodism from very small doses. A professional gentleman of my acquaintance cannot tolerate the drug in doses of two or three grains without the development of a severe coryza in a few hours. Another of my patients develops iodism within a few minutes after spraying the throat with a weak iodine solution.

There are three principal forms of eruption which may result from iodine and the iodides, viz.: acne, erythema, and purpura. Of these eruptions acne is the most frequent, and may be slight or quite extensive, the pustules varying from the size of the head of a pin to quite extensive phlegmonoid abscesses. Erythema, when it occurs, is usually situated upon the nose, cheeks or forehead, and is followed by

branny desquamation. It may, however, run into eczema. Any of these forms of eruption may be attended by considerable heat and itching.

Severe and well marked purpura hemorrhagica is occasionally noted in cases of tertiary syphilis treated by large doses of the iodide of potassium. In such cases we have the combined evil propensities of the syphilitic cachexia and large doses of iodine to explain the profound blood changes to which the purpuric extravasations are attributable.* Fatal cases of iodine poisoning have been reported, hence a certain amount of caution must be exercised in cases in which there is a marked contra-indicating idiosyncrasy. Dr. Wolf, of Goritz, has reported a case recently of a man with cardiac hypertrophy and "subacute kidney disease," who died as a result of the administration of thirty grains of potassic iodide in about thirty-six hours. It is quite easy to explain this case independently of any idiosyncrasy. The irritating effect of the iodide completely suspended the action of the kidneys, which were already impaired by disease. Such cases are useful in impressing upon us the necessity of care in our treatment of patients with renal disease.

All of the evil effects of the iodides rapidly disappear upon the cessation of the drug, and the administration of such tonics as quinine, iron, and cod liver oil, with free doses of such diuretics as the citrate or acetrate of potassium. The cause of the evil phenomena described is usually defective action of the kidneys, hence the advisability of promoting free diuresis during a course of the iodides. Acne, in certain special cases of idiosyncrasy, may be prevented by the administration of Fowler's solution of arsenic, conjointly with the iodides. A recent paper on "Iodinism" by Dr. E. J. Kemph, published in the Medical Herald, gives some excellent deduc-

* Otis claims to have seen patches resembling diphtheritic deposit upon the mucous membranes as a result of the iodides.

tions regarding the administration which will bear repetition. The author gives the following resume of his paper:

"1. Large draughts of water taken immediately after the drug prevents the more severe effects of iodinism by diluting the salt and causing its rapid elimination. If starch water is not immediately on hand, pure water should be largely given to one poisoned with iodine.

"2. The tolerance of iodine varies greatly in different subjects. A dram of tincture of iodine caused one individual no inconvenience, and five drops of the same tincture caused active symptoms of iodinism in another.

"3. This variation makes iodine an unreliable remedy, and it should induce us to commence with the smallest dose allowable in any case. If the patient bears it well we can increase the dose, and besides it is a well-known fact that the individual will become habituated to the drug, and the danger of inducing iodinism will be reduced to a minimum.

"4. The tincture of iodine is the preparation of the drug most likely to cause iodine poisoning by mistake, as only one drop more than is prescribed may be sufficient to cause iodinism. The tincture ought never to be used internally, as there are other and more reliable preparations of iodine that may be used when the remedy is indicated.

"5. Children especially should be watched when taking iodine preparations, though, as a rule, they bear the drug in proper doses as well as adults."

There is a great tendency on the part of the profession to recommend various new and questionable preparations in the treatment of syphilis. Certain vegetable preparations have enjoyed a more or less long-lived popularity in this respect. Sarsaparilla was long thought to be a specific. Among the new preparations are cascara amarga, berberis aquafolium, stillingia and other drugs, alone or in combination. I advise you to try these things, in the

firm belief that you will soon discover their fallacies and come back to our reliable friends, iodine and mercury. As bitter tonics they are all more or less useful, but as specifics they are arrant humbugs. A certain quasi-patent medicine, known as "McDade's Mixture," and composed of various vegetable ingredients, was introduced some time ago, and I am sorry to say was fathered by no less a man than the late Marion Sims, and indorsed by some other very good men, who must feel proud of the distinction of having attached their testimonials to a remedy which has since been heralded in every newspaper as the popular remedy for syphilis. As a matter of fact, it is on a par with its quite as respectable contemporary, the three S's, as a therapeutic agent. Tayuga, another remedy of doubtful origin which was recommended some years ago, has been given a fair trial in syphilis, but with negative results. The bichromate of potassium has been recently recommended, but I have had no experience with it. This drug was first introduced by J. Edmund Güntz, of Dresden, who claims surprisingly good results from its use. He at first gave gr. $\frac{1}{15}$ in combination with potassium nitrate three times a day, but subsequently found a better effect from what he styles "chromwasser," which consists of a solution of potassium bichromate in carbonic acid water. With this preparation he claims to be able to give 3½ grains of the drug daily, the quantity of carbonated water necessary being about 6,000 grammes. The remedy is to be given after meals. Güntz claims that this remedy is curative in syphilis on account of its powerful oxidizing properties.

It is best to be liberal, and give different remedies a fair trial, irrespective of their origin, and such has been my custom, but I think that you will find that the proportion of cases of syphilis which is curable by the judicious use of mercury and iodine is so large and so gratifying that you will waste no unnecessary time upon new and strange drugs. *1. In conclusion I will mention two remedies which are decidedly

beneficial as tonics in syphilis, viz.: the fl. extract of coca and iodoform. Coca is an excellent tonic when used conjointly with strictly anti-syphilitic treatment, and tends decidedly to relieve the nervous depression from which most syphilitics suffer. †2. Iodoform will be found most useful in cases which do not tolerate mercury and iodine well, and should be combined with the exsiccated sulphate of iron or the iron by hydrogen, the latter perhaps being the most useful and convenient. There are two other drugs which, while not in any sense curative, will be found beneficial in syphilis. These are the potassium chlorate and ammonium chloride. The former in doses of a tablespoonful of the saturated solution thrice daily seems to act very nicely when conjoined with the regular mercurial course, particularly when oral or facial lesions are prominent symptoms. The ammonium chloride assists in dissolving the young connective tissue or plastic deposit which forms the bulk of syphilitic lesions. It has seemed especially useful in nervous syphilis. It is best given in combination with the ordinary mixed treatment. Dr. Dumesnil, of St. Louis, also claims excellent results from this drug.

In the syphilitic cachexia, and particularly in that attendant upon the last stages of the disease, the chloride of gold and sodium is very valuable. I have used it hypodermically quite extensively, and am convinced of its efficacy. In bone and nervous lesions it is of especial value. Combined with the elixir of the three chlorides, of which I have already spoken, it can with great advantage be given internally. The following is a serviceable formula:

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*Bumstead and Taylor estimate the proportion of cures at about 95 per cent, but this is somewhat exaggerated. †2. Dr. Taylor, of New York, also praises the erythroxylon coca as follows: "Its marked tonic effect upon the heart, nervous system, and capillaries, and its power to invigorate the system, to improve nutrition, and to sustain life, is so great that its use in syphilis, secondary to that of mercury and iodide of potassium, is attended by results which no other agent known to us possesses. It is especially useful in the anaemia and cachexia of the secondary period." He further especially emphasizes its great value in "marked debilitated and cachectic conditions."

℞ Aurii et sodii chlor. ..... gr. ii
Elix. chlorides Co ..... ℥ iv
(R. and H.)
M. Sig. ℥i.—After each meal.

Before leaving the subject of the treatment of syphilis, I desire to call your particular attention to several little items in the local management of the disease, which may prove of great service to you. There is nothing of importance to add to what I have already said regarding the treatment of the chancre itself, but some of the secondary lesions require attention. Mucous patches sometimes give great annoyance, and refuse to yield to purely constitutional treatment, becoming sluggish and indolent. In such an event, the pure acid nitrate of mercury will be found to be the best application. Before applying it, the lesion should be dried with a piece of bibulous paper or absorbent cotton. The surface should then be thoroughly cauterized, after which it should be again dried. The nitrate of silver may be used in the same manner. Sometimes cauterization is not tolerated, the sore becoming inflamed and irritable. In such cases the tr. benzoin co. either alone or in combination with the mercuric chloride will be found most effectual. It coats the lesion with a deposit of the gum benzoin, and in addition to its mildly stimulant and antiseptic action, protects the surface from irritation. When mucous patches hypertrophy, and form tubercles or condylomata, an application of hydrarg. bichlor. in collodion in a strength of four to twenty grains to the ounce, will be found to remove them very rapidly. Calomel, zinc oxide, salicylic acid and iodoform are also all quite useful applications.* Washing the parts in salt and water followed

* Salicylic acid ointment or plaster and chrysarobin are very useful applications in the early syphilides and syphilitic psoriasis. Mauriac recommends the following formula :

℞ Ol. cadini, Ung. Hydrarg. } each .... partes j
Vaselinæ .... partes xv

M.—To be used by inunction, morning and evening, for syphilitic psoriasis of the palms and soles.

by the application of calomel is also of service, as nascent bichloride of mercury is formed and acts very powerfully upon the lesions. It will often be found that very obstinate skin lesions will improve rapidly under mercurial fumigations, after all other methods of treatment have proved inefficacious. Dr. F. B. Kane described in the Dublin Journal of the Medical Sciences for November, 1874, an apparatus for local fumigation of syphilitic lesions, which is sometimes useful. The Journal in question contains a good illustration of the apparatus, to which you may refer for the details of its application. I have been using sprays of bichloride solution and iodoform and ether, with good success, especially in pharyngeal lesions. In case of secondary or even tertiary lesions upon the face which are non-ulcerative, the solution of bichloride in collodion will be found to remove them quite rapidly. Be careful, however, not to cause severe blistering of the skin by too powerful or too frequent applications. I find that a solution of the bichloride in the compound tincture of benzoin is even better than the collodion solution. It is less apt to blister, and may be entrusted to the patient for application. It is, however, rather disagreeable in that it discolors the skin, and is with difficulty removed. The oleate of copper, as recommended by Dr, Shoemaker for freckles and other pigmentary lesion of the skin, seems to act well in removing the discolorations left by the syphilides. Soaps containing the bichloride are also useful. In case of ecthymatous or rupial ulcerations, frictions with the oleate of mercury are beneficial. Gummy ulceration, especially when situated in the mouth or pharynx, may be best treated by the application of benzoin, for although iodoform is also quite effectual, it is far more unpleasant, for most people do not like to have such an odorous application in so close proximity to their nasal and digestive organs.

The following formulæ will be found quite effectual in lesions of the throat and nose :

℞ Iodoformi
Camphoræ ..... aa ℥ iii
Morphiæ ..... gr. iv
Pulv. acaciæ ..... ℥ ii
Ac. tannici ..... gr, x
Bismuthi subnit ..... ℥ iv
M. Sig.—Use with powder blower.

℞ Iodinii pur ..... gr. xx
Kalii iodii ..... gr. lx
Ac. carbolici ..... ℥ ss
Olei eucalypti ..... ℥ i
Boro-glyceridi ..... ℥ iii
Olei menth. pip. ..... mx
Glycerin. tannat. q. s. ad. ..... ℥ i
M. Sig.—Apply with probang or camel's-hair pencil.

There is one complication of syphilis which merits special mention; I refer to syphilitic iritis; In this disease synechiæ or adhesions form very rapidly, and treatment must be correspondingly vigorous. Where possible, the responsibility should be divided with a good oculist. The patient must be brought under mercury as rapidly as possible. Either hypodermic injections or minute doses of calomel frequently repeated are excellent methods. Leeches should be applied to the temporal region, and cathartics administered to secure the benefits of derivation and local depletion. Either hot or cold applications may prove beneficial. Most important of all is dilatation of the pupil by atropine. A solution of from 4 to 8 grains to the ounce should be instilled into the eye several times daily until dilatation is complete.

We sometimes meet with cases of necrosis of the bones in various situations in late syphilis, or, more properly speaking, the period of sequelæ. Try and determine whether the osseous troubles are due to syphilis or to mercury, and then treat them upon general principles. Remember that tonics are always indicated in these cases, and that the iodides are our main reliance, mercury, if given at all, being indicated

only in tonic doses. The following case is a fair illustration of the destruction sometimes produced by necrosis in late syphilis. A young man of thirty was referred to me by his physician, for a possible operation upon the naso-pharyngeal cavity for the removal of dead bone. I found the palatal and nasal bones entirely destroyed, and that destructive ulceration had already attacked the vault of the pharynx and was threatening the osseous structures at the base of the skull. Mercurial treatment had been persisted in for the entire course of the disease, which had been contracted nine years before. I removed a few small scales of necrosed bone, which were partially detached, and put the patient upon tonics and increasing doses of the iodide. Improvement was quite rapid, and the patient was sent home at the end of six weeks in comparatively good health. As a parting injunction in the treatment of syphilis, I wish you to remember that cleanliness is nowhere productive of better results than in this disease. The Turkish or Russian bath once or twice weekly has an excellent general as well as local effect, and where possible to use them, recommend them all to your patients. These baths are such a useful adjunct to other methods of treatment of syphilis that I wonder at the negligence of most physicians in omitting to prescribe them. They have several effects in syphilis which are of paramount importance. These are briefly:

1. Stimulation of the nutrition of the skin, thus rendering eruptions less likely to occur.

2. Elimination of peccant materials and of mercury itself, thus preventing saturation of the system with the drug, and assisting the system in throwing off the products of retrograde metamorphosis of syphilitic neoplasia.

3. Increase of retograde metamorphosis, thus hastening resolution of syphilitic deposits.

4. A general tonic effect.

An excellent adjuvant to the baths is the use of hot water internally at the time the baths are taken. This

prevents the otherwise debilitating effects of frequent baths, and in addition keeps the kidneys in active functional condition. Used in this manner, the Turkish or Russian bath will often accomplish essentially the same end as the treatment in vogue at the famous Hot Springs of Arkansas.

In very obstinate cases, however, a course at the Hot Springs will sometimes be of service when all other means fail. When a patient goes to this well-known resort, he is usually willing and financially able to attend strictly to treatment, something that he will seldom do at home. The careful attention to treatment and diet, the cessation of all bad habits, and the change of climate, probably have as much to do with the excellent results sometimes obtained as any curative property which may be possessed by the waters. Should you think it wise to advise patients to go to the Hot Springs, be sure and recommend them to some reputable physician in that resort or they may fall among the Philistines; they certainly require careful supervision at the hands of a competent practitioner, in order that they may obtain the best results from their sojourn at the Springs. There are skillful and conscientious practitioners at that famous resort, and there is no reason why your patients should not be put in the right way to find them, rather than to allow them to take their chances.

A LECTURE ON

SEXUAL PERVERSION, SATYRIASIS AND NYMPHOMANIA.[1]

Gentlemen: The subject of sexual perversion (*Contrare Sexualempfindung*), although a disagreeable one for discussion, is one well worthy the attention of the scientific physician, and is of great importance in its social, medical and legal relations.[2]

The subject has been until a recent date studied solely from the standpoint of the moralist, and from the indisposition of the scientific physician to study the subject, the unfortunate class of individuals who are characterized by perverted sexuality have been viewed in the light of their moral responsibility rather than as the victims of a physical and incidentally of a mental defect. It is certainly much less humiliating

[1] Phila. Med. & Surg. Rep., Sept. 7, 1889.

[2] In a recent article, Dr. J. G. Kiernan, of Chicago, in discussing the hypothetical dependence of the Whitechapel murders upon sexual perversion, says: "The present subject may seem to trench on the 'prurient,' which in medicine does not exist, since 'science, like fire, purifies everything,' and what Macaulay calls 'the mightiest of human instincts' is too intimately related to the physical basis of human weal and woe for any physician prudishly to ignore any of its phases."

to us as atoms of the social fabric to be able to attribute the degradation of these poor unfortunates to a physical cause, than to a willful viciousness over which they have, or ought to have, volitional control. Even to the moralist there should be much satisfaction in the thought that a large class of sexual perverts are physically abnormal rather than morally leprous. It is often difficult to draw the line of demarcation between physical and moral perversion. Indeed, the one is so often dependent upon the other that it is doubtful whether it were wise to attempt the distinction in many instances. But this does not affect the cogency of the argument that the sexual pervert is generally a physical aberration—a *lusus naturæ*.

Krafft-Ebing[1] expresses himself upon this point as follows: "In former years I considered *contrare Sexualempfindung* as a result of neuro-psychical degeneration, and I believe this view is warranted by more recent investigations. As we study into the abnormal and diseased conditions from which this malady results, the ideas of horror and criminality connected with it disappear, and there arises in our minds the sense of duty to investigate what at first sight seems so repulsive, and to distinguish, it may be, between a perversion of natural instincts which is the result of disease, and the criminal offenses of a perverted mind against the laws of morality and social decency. By so doing the investigations of science will become the means of rescuing the honor and re-establishing the social position (sic) of many an unfortunate whom unthinking prejudice and ignorance would class among depraved criminals. It would not be the first time that science has rendered a service to justice and to society by teaching that what seem to be immoral conditions and actions are but the results of disease."

There is in every community of any size a colony of

[1] Journ. Psychiatry and Neurology, Vol. IX, No. 4, p. 505.

male sexual perverts; they are usually known to each other, and are likely to congregate together. At times they operate in accordance with some definite and concerted plan in quest of subjects wherewith to gratify their abnormal sexual impulses. Often they are characterized by effeminacy of voice, dress and manner. In a general way, their physique is apt to be inferior—a defective physical make-up being quite general among them, although exceptions to this rule are numerous.

Sexual perversion is more frequent in the male; women usually fall into perverted sexual habits for the purpose of pandering to the depraved tastes of their patrons rather than from instinctive impulses. Exceptions to this rule are occasionally seen. For example, I know of an instance of a woman of perfect physique, who is not a professional prostitute, but moves in good society, who has a fondness for women, being never attracted to men for the purpose of ordinary sexual indulgence, but for perverted methods. The physician rarely has his attention called to these things, and when evidence of their existence is placed before him, he is apt to receive it with skepticism. He regards the subject as something verging on Munchausenism, or, if the matter seem at all credible, he sets it aside as something unholy with which he is not or should not be concerned. It is indeed not to be wondered at that the doctor, who sees so much to disgust him with the human animal, should be reluctant to add to his store of contempt. The man about town is very often *au fait* in these matters, and can give very valuable information. Indeed, witnesses enough can be found to convince the most skeptical.

Sexual perversion may be best defined in a general way as the possession of impulses to sexual gratification in an abnormal manner, with a partial or a complete apathy toward the normal method.

The affection presents itself in several forms, which may be tabulated as follows:

I. Congenital and perhaps hereditary sexual perversion.	*a.* Sexual perversion without defect of structure of sexual organs.
	b. Sexual perversion with defect of genital structure, *e. g.*, hermaphroditism.
	c. Sexual perversion with obvious defect of cerebral development, *e. g.*, idiocy.
II. Acquired sexual perversion.	*a.* Sexual perversion from pregnancy, the meno-pause, ovarian disease, hysteria, etc.
	b. Sexual perversion from acquired cerebral disease, with or without recognized insanity.
	c. Sexual perversion (?) from vice.
	d. Sexual perversion from over stimulation of the nerves of sexual sensibility and the receptive sexual centers, incidental to sexual excesses and masturbation.

As regards the clinical manifestations of the disease sexual perverts may be classified as : (*a*) Those having a predilection (affinity) for their own sex; (*b*) those having a predilection for abnormal methods of gratification with the opposite sex; (*c*) those affected with bestiality. Instances of all these different varieties have been observed.

The Precise Causes of sexual perversion are obscure. The explanation of the phenomenon is in a general way much more definite. *Just as we may have variations of physical form, and of mental attributes, in general, so we may have variations and perversions of that intangible entity : sexual affinity.* In some cases, perhaps, sexual differentiation has been imperfect, and there is a reversion of type ; as Kiernan remarks :[1] "The original bi-sexuality of the ancestors of the race, shown in the rudimentary female organs of the male, could not fail to occasion functional, if not organic, reversions when mental or physical manifestations were interfered with by disease or congenital defect. The inhibitions on excessive action to accomplish a given purpose, which the race has acquired through centuries of evolution, being removed, the

[1] Medical Standard, November, 1888.

animal in man springs to the surface. Removal of these inhibitions produces, among other results, sexual perversions."

Reasoning back to cell life we see many variations of sexual affinity and the function of reproduction, between the primal segmentation of the cell—the lowest type of procreative action—and that complete and perfect differentiation of the sexes which requires a definite act of sexual congress as a manifestation of the acme of sexual affinity, and for the purpose of reproduction. *The variations in the methods of sexual gratification—or to attribute it to instinct, of perpetuating the species—which are presented to the students of natural history, are numerous and striking.* It is not my intention, however, to give this matter more than passing notice. The method of sexual gratification—*i. e.*, procreation—of fishes, is a curious phenomenon. It is difficult to appreciate the sexual gratification involved in the deposition of the milt of the male fish upon the spawn of the female, yet that the so-called instinctive act of the male is unattended by gratification is improbable. Indeed, it is an argument as applicable to the lower animals as to man, that, were the act of procreation divested of its pleasurable features, the species would speedily become extinct; for the act of procreation *per se* is possessed of no features of attractiveness, but of many that are repulsive and in themselves productive of discomfort.

It is puzzling to the healthy man and woman, to understand how the practices of the sexual pervert can afford gratification. If considered in the light of reversion of type, however, the subject is much less perplexing. That mal-development, or arrested development, of the sexual organs should be associated with sexual perversion is not at all surprising; and the more nearly the individual approximates the type of fœtal development which exists prior to the commencement of sexual differentiation, the more marked is the aberrance of sexuality.

There is one element in the study of sexual perversion that deserves especial attention. It is probable that few bodily attributes are more readily transmitted to posterity than peculiarities of sexual physiology. The offspring of the abnormally carnal individual is likely to be possessed of the same inordinate sexual appetite that characterizes the parent. The child of vice has within it, in many instances, the germ of vicious impulse, and no purifying influence can save it from following its own inherent inclinations. Men and women who seek, from mere satiety, variations of the normal method of sexual gratification, stamp their nervous systems with a malign influence which in the next generation may present itself as true sexual perversion. Acquired sexual perversion in one generation may be a true constitutional and irradicable vice in the next, and this independently of gross physical abberations. Carelessness on the part of parents is responsible for some cases of acquired sexual perversion. Boys who are allowed to associate intimately, are apt to turn their inventive genius to account by inventing novel means of sexual stimulation, with the result of ever after diminishing the natural sexual appetite. Any powerful impression made upon the sexual system at or near puberty, when the sexual apparatus is just maturing and very active, although as yet weak and impressionable, is apt to leave an imprint in the form of sexual peculiarities that will haunt the patient throughout his after life. Sexual congress at an early period, often leaves its impression in a similar manner. Many an individual has had reason to regret the indulgences of his youth because of its moral effect upon his after life. The impression made upon him in the height of his youthful sensibility is never eradicated, but remains in his memory as his ideal of sexual matters; for—if you will pardon the metaphor—there is a physical as well as an intellectual memory. As he grows older and less impressionable, he seeks vainly for an experience

similar to that of his youth, and so joins the ranks of the sexual monomaniacs, who vainly chase the Will-o'-the-wisp: sexual gratification, all their lives. Variations of circumstance may determine sexual perversion rather than abnormally powerful desire. Let the physician who has the confidence of his patients inquire into this matter, and he will be surprised at the result. Only a short time since, one of my patients, a man of exceptional intellect, volunteered a similar explanation for his own excesses. Satiety also brings in its train a deterioration of normal sexual sensibility, with an increase, if anything, in the sexual appetite. As a result, the deluded and unfortunate being seeks for new and varied means of gratification, often degrading in the extreme. Add to this condition, intemperance or disease, and the individual may become the lowest type of sexual pervert. As Hammond concisely puts it, regarding one of the most disgusting forms of sexual perversion: "Pederasty is generally a vice resorted to by debauchees who exhaust the resources of the normal stimulus of the sexual act, and who for a while find in this new procedure the pleasure which they can no longer obtain from intercourse with women."

When the differentiation of sex is complete from a gross physical standpoint, it is still possible that the receptive and generative centers of sexual sensibility may fail to become perfectly differentiated. The result under such circumstances might be, upon the one hand, sexual apathy, and upon the other, an approximation to the female or male type, as the case may be. Such a failure of development and imperfect differentiation of structure, would necessarily be too occult for discovery by any physical means at our command. It is, however, but too readily recognized by its results.

There exists in every great city so large a number of sexual perverts, that seemingly their depraved tastes have been commercially appreciated by the

demi-monde. This has resulted in the formation of establishments whose principal business it is to cater to the perverted sexual tastes of a numerous class of patrons. Were the names and social positions of these patrons made public in the case of our own city, society would be regaled with something fully as disgusting, and coming much nearer home, than the *Pall Mall Gazette* exposure.[1]

The individuals alluded to would undoubtedly resent the appellation of "sexual pervert;" but, nevertheless, in many instances they present the disease in its most inexcusable form: that from vicious impulse. Personally, I fail to see any difference, from a moral standpoint, between the individual who is gratified sexually only by oral masturbation performed by the opposite sex, and those unfortunate mortals whose passions can be gratified only by performing the active role in the same disgusting performance. One is to be pitied for his constitutional fault; the other to be despised for his deliberately acquired debasement. In the case of the professional prostitute who panders to the depraved sexual tastes of certain male specimens of the *genus homo,* she has, at least, the questionable excuse of commercial instinct, and in some cases the more valid one of essential sexual perversion. These excuses the majority of her patrons certainly do not have.

An interesting theory, bearing upon the question of sexual perversion in its relations to evolutionary reversion, is advanced by Professor S. V. Clevenger.[2] This is well worthy of repetition and I will therefore quote it verbatum: "A paper on Researches into the

[1] Since the above was written the world has been regaled with the exposure of an establishment in London patronized by the aristocracy, which was devoted to the procurement of young boys for the purpose of passive pederasty. I have also obtained positive knowledge of a physician in this city who has presented disgusting manifestations of sexual perversion to his female patients.

[2] Physiology and Psychology, 1885.

Life History of the Monads, by W. H. Dallinger, F. R. M. S., and J. Drysdale, M. D., was read before the Royal Microscopical Society, Dec. 3, 1873, wherein fission of the monad was described as being preceded by the absorption of one form by another. One monad would fix on the sarcode of another, and the substance of the lesser or under one would pass into the upper one. In about two hours the merest trace of the lower one was left, and in four hours fission and multiplication of the larger monad began. A full description of this interesting phenomenon may be found in the *Monthly Microscopical Journal* (London), for October, 1877. Professor Leidy has asserted that the amœba is a cannibal, whereupon Mr. Michels, in the *American Journal of Microscopy*, July, 1877, calls attention to Dallinger and Drysdale's contribution, and draws therefrom the inference that each cannibalistic act of the amœba is a reproductive, or copulative one, if the term is admissible. The editor (Dr. Henry Lawson) of the English journal agrees with Michels."

"Among the numerous speculations upon the origin of the sexual appetite, such as Maudsley's altruistic conclusion, which always seemed to me to be far-fetched, I have encountered none that referred its derivation to hunger. At first glance such a suggestion seems ludicrous enough, but a little consideration will show that in thus fusing two desires, we have still to get at the meaning and derivation of the primary one, desire for food. The cannibalistic amœba may, as Dallinger's monad certainly does, impregnate itself by eating one of its own kind, and we have innumerable instances, among algæ and protozoa, of this sexual fusion appearing very much like ingestion. Crabs have been seen to confuse the two desires by actually eating portions of each other while copulating ; and in a recent number of the *Scientific American*, a Texan details the *mantis religiosa* female eating off the head of the male mantis during conjugation. Some of the female *arachnidæ* find it necessary to finish the marital repast by

devouring the male, who tries to scamper away from his fate. The bitings and even the embrace of the higher animals appears to have reference to this derivation. It is a physiological fact that association often transfers an instinct in an apparently outrageous manner. With quadrapeds it is most clearly olfaction that is most related to sexual desire and its reflexes; but not so in man. Ferrier diligently searches the region of the temporal lobe near its connection with the olfactory nerve for the seat of sexuality; but with the diminished importance of the smelling sense in man, the faculty of sight has grown to vicariate olfaction; certainly the 'lust of the eyes' is greater than that of other special sense organs among Bimana.

"In all animal life multiplication proceeds from growth, and until a certain stage of growth, puberty, is reached, reproduction does not occur. The complementary nature of growth and reproduction is observable in the large size obtained by some animals after castration. Could we stop the division of an amœba, a comparable increase in size would be effected. The grotesqueness of these views is due to their novelty, not to their being unjustifiable. While it must thus seem apparent that a primeval origin for both ingestive and sexual desire existed, and that each is a true hunger, the one being repressible, and in higher animal life being subjected to more control than the other, the question then presents itself: What is hunger? It requires but little reflection to convince us of its potency in determining the destiny of nations and individuals, and what a stimulus it is in animated creation. It seems likely that it has its origin in the atomic affinities of inanimate nature, a view monistic enough to please Haeckel and Tyndall."

Dr. Spitzka,[1] in commenting on the foregoing, says: "There are some observations made by alienists

[1] *Science*, June 25, 1881.

which strongly tend to confirm Dr. Clevenger's theory. It is well known that, under pathological circumstances, relations, obliterated in higher development and absent in health, return and simulate conditions found in lower and even in primitive forms. An instance of this is the pica or morbid appetite of pregnant women and hysterical girls for chalk, slate-pencils and other articles of an earthy nature. To some extent this has been claimed to constitute a sort of reversion to the oviparous ancestry, which, like the birds of our day, sought the calcerous material required for the shell structure in their food. There are forms of mental perversion properly classed under the head of the degenerative mental states with which a close relation between the hunger appetite and sexual appetite becomes manifest. Under the heading '*Wallust, Mordlust, Anthropophagie*,' Krafft-Ebing describes a form of sexual perversion where the sufferer fails to find gratification unless he or she can bite, eat, murder or mutilate the mate. He refers to the old Hindoo myth: Civa and Durga, as showing that such observations in the sexual sphere were not unknown to the ancient races. He gives an instance where, after the act, the ravisher butchered his victim and would have eaten a piece of the viscera; another where the criminal drank the blood and ate the heart; still another where certain parts of the body were cooked and eaten."[1] *Nature* (London), commenting on my article, quotes Ovid: "*Mulieres in coitu nonnemque genas cervicemque maris mordunt.*" Illustrations of the varying types of sexual perversion are of late years finding their way into literature. A very

[1] Ueber gewisse Anomalien des Geschlechtstriebes. Von Krafft-Ebing, Archiv. fur Psychiatre, VII. It is unnecessary to call attention to the logic of Dr. Kiernan's deductions from the above as applied to the Whitechapel horrors. ("Sexual Perversion and the Whitechapel Murders." Dr. J. G. Kiernan, *Medical Standard*, November, 1888.)

interesting series of cases is related by Professor von Krafft-Ebing. *Journal of Neurology and Psychiatry.*

Hammond, quoting from Tardieu,[1] chronicles the following interesting points with regard to one form of sexual perversion: "I do not pretend to explain that which is incomprehensible, and thus to penetrate into the causes of pederasty. We can nevertheless ask if there is not something else in this vice than a moral perversion, than one of the forms of *psychopathia sexualis*, of which Kaan has traced the history. Unbridled debauchery, exhausted sensuality, can alone account for pederastic habits as they exist in married men and fathers of families, and reconcile with a desire for women the existence of these impulses to unnatural acts. We can form some idea on the subject from a perusal of the writings of pederasts containing the expression of their depraved passions. Casper has had in his possession a journal in which a man, member of an old family, had recorded, day by day, and for several years, his adventures, his passions, and his feelings. In this diary he had, with unexampled cynicism, avowed his shameful habits,which had extended through more than thirty years, and which had succeeded to an ardent love for the other sex. He had been initiated into these new pleasures by a procuress, and the description which he gives of his feelings is startling in its intensity. The pen refuses to write of the orgies depicted in this journal, or to repeat the names which he gave to the objects of his love."

"I have had frequent occasion to read the correspondence of known pederasts, and have found them applying to each other, under the forms of the most passionate language, idealistic names which legitimately belong to the diction of the truest and most ardent love. But it is difficult not to admit the existence in some cases of a real pathological alteration

[1] "Sur les attentats aux mœurs. Paris, 1858, p. 125.

of the moral faculties. When we witness the profound degradation, the revolting salacity of the individuals who seek for and admit to their disgusted favors men who are gifted both with education and fortune, we might well be tempted to think that their sensations and reason are altered; but we can entertain no doubt on the subject, when we call to mind facts such as those I have had related to me by a magistrate, who has displayed both ability and energy in the pursuit of pederasts. One of these men, who had fallen from a high position to one of the lowest depravity, gathered about him the dirty children of the streets, knelt before them and kissed their feet with passionate submission before asking them to yield themselves to his infamous propositions. Another experienced singularly voluptuous sensations by having a vile wretch administer violent kicks on his gluteal region. What other idea can we entertain of such horrors than that those guilty of them are actuated by the most pitiable and shameful insanity?"

Some of the manifestations of sexual perversion, quoted by various authorities, are very extraordinary, and it is difficult to associate them with titillations of the sexual sensibility. Perhaps the most familiar of these cases is that of Sprague, who was committed in Brooklyn a number of years ago for highway robbery. [1] It is unnecessary to present this case in detail, but an outline of it may prove interesting. Sprague was arrested immediately after having assaulted a young lady by throwing her down violently, removing one of her shoes and running away with it. He made no attempt to steal anything else, although she had on valuable jewelry. When the trial came on, insanity was alleged as a defense. Numerous witnesses, the principal of whom was the father of the defendant, a clergyman of the highest respectability, testified to the erratic conduct of the prisoner. A family history

[1] Beck: Medical Jurisprudence, Vol. I, 1860, p. 732.

was elicited which bore most pertinently upon Sprague's case. His grandfather, grandmother, great-grand-uncle, three great-aunts, and a cousin having been insane. He had himself in his youth received numerous blows and falls upon the head, and within a year from the last head injury he had developed severe headaches, associated with which his friends noticed a bulging of the eyes. About this time the prisoner developed a fondness for stealing and hiding the shoes of females about the house, and it was found necessary by his relatives and the female domestics to carefully conceal or lock up their shoes to prevent his abstracting them. Upon investigation it was dis covered that the act of stealing or handling the shoes produced in him sexual gratification."

Wharton[1] several years ago chronicled a most peculiar case of sexual perversion. In this instance the morbid sexual desire impelled the individual to assault young girls upon the streets of Leipzig by grasping them and plunging a small lancet into their arms above the elbow. The fact was developed after his arrest that these peculiar acts of assault were accompanied by seminal emissions. This authentic case gives a vivid coloring to the rational hypothesis that the now famous Whitechapel assassin is a sexual pervert, a theory which Kiernan in particular has supported, and which I believe has suggested itself to the minds of the majority of medical men who have given the murders even slight consideration.

Many cases of sexual perversion manifest themselves only under the influence of disease or of drunkenness. Ovarian irritation, and those more obscure cases of hysteria in women which we are unable to trace to a definite physical cause, are frequently associated with sexual perversion. The physiological(?) disturbance incidental to pregnancy is, in certain neurotic patients, productive of similar aberration.

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[1]A Treatise on Mental Unsoundness, etc., Philadelphia, 1873.

Whether the influence of liquor obtunds the moral faculties, or develops an inherent defect of sexual physiology in any given case, is of course difficult to determine. I know of an individual who conducts himself with perfect propriety when sober, and who is a man of exceptional intellect, but who, when under the influence of alcohol, is too low for consort with the human species.

The association of sexual perversion with malformations of the sexual organs with or without associated close approximation to the general physique of the opposite sex, male or female, as the case may be, is certainly not surprising. I have met, in my own experience, with a most peculiar illustration of this form of sexual perversion, in the form of a young mulatto hypospadiac. This man had marked hypospadias, and had, it seems, an affinity for women, as illustrated by the fact that he contracted a gonorrhœa in the normal manner. That he also had a predilection for the passive role in the act of copulation was demonstrated by the fact that a number of young lads, ranging from ten to seventeen years of age, who lived in the neighborhood in which the spurious hermaphrodite was employed in the capacity of cook, contracted from him typical gonorrhœa, for which several of them came under my care.

A peculiar case was recently reported to the Chicago Medical Society by Dr. A. R. Reynolds, of this city, of a man who had a love affair with a woman whose right lower extremity had been amputated at the thigh, and became so much attached to her that he was afterward impotent with perfectly formed women, it being necessary for him to secure females who had undergone mutilation similar to that of his former attachment in order that he might be sexually gratified.[1] A peculiar phase of sexual perversion is occasionally seen among masturbators, male and fe-

[1] *Western Medical Reporter*, Nov., 1888.

male. The individuals suffering from this have a peculiar predilection for titillating the sexual organs in the most outlandish fashion. Such patients are in many instances particularly fond of introducing foreign bodies of various kinds into the uretha and thus gratifying their sexual desires. Such cases occur even among persons who have opportunities for normal gratification. Thus an interesting case is reported by Poulet[1] of a married woman, the mother of three children, who failed to receive gratification from ordinary intercourse, and practiced masturbation with a blunt piece of wood fastened to a wire. Her unfortunate failing was exposed through the slipping of the foreign body from her grasp into the bladder. Kiernan reports a somewhat similar case of an insane girl who was admitted into his service at the Cook County Insane Asylum. In this instance the physical appearance of the sexual organs and anus led to a suspicion of pederasty which was confirmed upon investigation.[2]

I have already directed attention to forms of sexual perversion which do not conform to Westphal's definition of *Contrare Sexualempfindung*, which implies a sexual predilection on the part of an individual for those of his or her own sex with an inversion for sexual intimacy with those of the opposite sex. In my opinion certain other cases of disease, the principal manifestation of which is excessive sexual desire, are really forms of sexual perversion. Such cases are often met with in both the male and the female.

Satyriasis is a disease that occurs in the male, with or without insanity, the principal manifestation of which is an abnormally excessive and unreasonable sexual desire. It is not a frequent disease as brought to the attention of the physician, probably because the opportunities for gratification of the male are relatively numerous.

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[1] Foreign Bodies."

[2] *Western Medical Reporter*, Nov., 1888.

The disease consists of a constant desire, attended with vigorous erections, which no amount of sexual intercourse in some instances will gratify. It has been termed "erotic delirium," and it may or may not be due to coarse disease of the brain. In the worst cases of the disease the unfortunate individual may be the subject of mania and delirium of a violent form. Acton[1] relates to the case of an old man, suffering from satyriasis, whose desire was so extreme that he would masturbate whenever he was brought in the presence of women. After his death a small tumor was found in the pons varolii.

Shocks and injuries involving the cerebellum are peculiarly apt to be followed by persistent erections. This phenomenon has been noticed in connection with executions by hanging. Injuries of the spinal cord, although in the majority of instances inhibiting the sexual function by producing complete paralysis of that portion of the cord which seems to bear an intimate relation to sexual sensibility, produce in some instances from irritation of the same nervous structure, persistent erection. Cases of this kind are related by Lallemand.[2] The following case is one which has been most frequently quoted:

"This man was a soldier, who, in climbing over the walls of the garrison, fell upon his sacrum. Following this injury he became paraplegic and suffered with persistent priapism. This lasted for some time, and could not be relieved by intercourse. All pleasurable sensations and the power of ejaculation were destroyed, although sexual desire was very ardent. During sleep, however, the unfortunate subject had lascivious dreams, accompanied by slight sensation and ejaculation."

The causes of satyriasis, as enumerated by different authorities, are: masturbation, diseases of the brain, particularly those affecting the cerebellum, injuries

[1] On the Reproductive Organs,

[2] On Spermatorrhœa.

and diseases of the spinal cord, sexual excesses and the administration of poisonous doses of cantharides. Prolonged continuance is another rare and dubious cause to which satyriasis has been ascribed.

J. W. Howe,[1] quoting from Blandet, describes a case of this kind. The patient was an earnest, hard-working and zealous missionary. He was unfortunate in the possession of an intensely passionate nature, although he had gratified himself in a vicious manner. So intense was his excitement in the presence of women that it became necessary to seclude himself from them as far as possible. This plan proved a failure, for he became so much worse that he suffered from satyriasis in an extreme degree. A cure was finally accomplished by the normal indulgence of his passion.

The mild form of excessive sexual desire called priapism, may be due to local irritation. In some instances such irritation will produce severe priapism without sexual desire. I have at present under my charge a gentleman who is suffering in this manner. He is about 50 years of age, and has been somewhat dissipated and a high liver, as a consequence of which he has gout in an extreme degree. He has suffered for several years from vesical irritation, attributed by him to stricture of long standing. The urethra on examination presents no abnormality; the urine is highly concentrated and strongly acid. As soon as the patient retires for the night, he begins to be troubled with severe erections, which are so marked as to be quite painful, and which persist during the entire night. Sexual intercourse gives no relief. I can only attribute this case to sexual hyperæsthesia, incidental to long continued gout and irritation of the genito-urinary tract. This does not manifest itself during the daytime, but during the night; when, as is well known, the spinal cord is relatively hyperæmic

[1] Excessive Venery.

and in a condition of increased functional activity. The same explanation holds good here that prevails in nocturnal emissions.

Nymphomania (erotomania, furor uterinus) is a disease analogous to satyriasis, occurring in the female. It is characterized by excessive and inordinate sexual desire, and often by the most pronounced lewdness and vulgarity of speech and action. In the most severe forms, it is apt to be associated with, and dependent upon, other forms of insanity, with or without gross brain disease. In some instances the disease is a reflex manifestation of irritative affections of the sexual apparatus. Thus, ovarian and uterine diseases are apt to be associated with it. Any irritation about the external genital organs in a female of hysterical temperament may produce the affection; all that is necessary being a nervous and excitable state of the nervous system, a passionate disposition, and the existence of local irritation of the sensitive sexual apparatus. Some of the recorded cases of nymphomania are very pitiful. It has been known to be associated with the cerebral distuabance incidental to pulmonary consumption. Thus, a case has been recorded of a woman who, in the last stages of this disease, exhibited the most inordinate sexual desire, and but a short time before her death importuned her husband to have intercourse with her.

The association of hysteria with this unfortunate condition of the mind and sexual organs is one with which nearly every gynecologist of experience is perfectly familiar. Nymphomania is also known to occur as a result of masturbation and sexual excess. In women of a highly erethistic temperament, it has been developed as a consequence of sudden cessation of the normal method of sexual indulgence.

A knowledge of sexual matters is by no means necessary to the development of nymphomania, for it has been known to occur in individuals who had neither masturbated nor indulged in sexual intercourse. Some

of the most painful cases of the disease have occurred during pregnancy. The principal astonishing feature of such unfortunate cases is the acquirement of lewd actions and expressions on the part of women previously and naturally pure-minded and refined. Such women may use expressions and commit actions that lead the physician to wonder where they they possibly have acquired a knowledge of them.

The gynecologist is compelled to be on his guard with reference to a not infrequent form of nymphomania, but one which is little suspected by those surrounding the patient, in which the woman develops a fondness for gynecological manipulations. The subterfuges and devices of such patients to induce handling of the sexual organs on part of the physician are something remarkable. Perhaps one of the most frequent forms of this malingering is the pretense of retention of urine; although every disease which they may have heard of will be complained of by such patients in their insane endeavors to obtain manipulations at the hands of gynecologists.

Howe relates an interesting case of this kind occurring under his observation at Bellevue Hospital:

"A girl, æt. 18, was admitted, supposed to be suffering from retention of urine. She was thin; her eyes were deep set, but bright and staring, and were found filled with tears. Her statement was that she had passed no water for three days; that she was subject to these attacks, and was treated by having her water drawn off. I introduced the catheter, and found only a few ounces of urine in her bladder—not enough, indeed, to corroborate her history. The next morning, as she had not urinated during the night, I drew off the urine again. While doing so I noticed by a series of peculiar convulsive movements, that she was under the influence of strong excitement. Further examination showed that the labia minora, clitoris and adjacent parts were red and swollen and bathed in a profuse mucous secretion. I then remembered that

on the previous evening she had shown a somewhat similar state of excitement, and gave the nurse orders to watch her closely all day. In the evening the nurse informed me that the patient kept up a constant friction of the genitals when she supposed no one was watching, and even when eyes were on her she endeavored, by uneasy movements in the bed, to continue the titillation. Knowing then what I had to deal with, the patient was given a sedative, and was told that she must empty her bladder without assistance. For thirty-six hours subsequently she obstinately insisted on her inability to urinate. When she was told no catheter would be employed again there was no further retention. Soon after she left the hospital I learned that a physician friend of mine was treating her for uterine disorder, but he, too, soon found out the true nature of the case, and advised her to get married."

Several cases of a similar nature have come under my own observation, one during my hospital experience, and two others in private practice.

The treatment of satyriasis and nymphomania consists chiefly in the removal of irritation of the sexual apparatus, the administration of anaphrodisiac remedies to be hereafter considered, and attempts to restrain sexual excesses, or to break the habit of masturbation, as the case may be. Where there is actual organic disease the case is likely to be found to be incurable in the majority of instances, particularly if the structural disease involves the nervous centers. In women, the extirpation of the ovaries, or the procedure of Mr. Baker Brown--clitoridectomy may be performed. Howe recommends the application of the actual cautery to the back of the neck. Basing this treatment upon the theory that the disease takes its origin in over-excitation of the nerve fibers of the cerebellum or some of the ganglia in the neighborhood, he also suggests blisters and sétons to answer the same purpose. Dry cupping to the nucha is also ser-

vicable. Means to restore the general health are always indicated. In the severe cases of the maniacal form of excessive sexual desire, the asylum is usually our only recourse.

URETHRAL AND GENITAL NEUROSES.

There are a few morbid conditions of a functional character which, although oftentimes an integral part of organic diseases of the organs which it is my special province to consider, are occasionally either morbid entities or else the prominent source of complaint on the part of the patient, indeed we are apt to be more often consulted regarding these functional or nervous derangements than the diseases upon which they frequently depend.

There is, perhaps, no subject in the whole range of genito-urinary disturbances of greater importance than the varied phenomena involving nervous derangements that are due, directly or indirectly, to pathological conditions of the various portions of the urethral canal. It is certain, also, that in no class of cases which come under the observation of the genito-urinary surgeon, is an accurate diagnosis of greater importance, or more difficult to accomplish. I feel, therefore, that a contribution to the special study and treatment of such cases is, to say the least, warrantable.

When we consider the vast amount of labor and talent that have been devoted to the study of the reflex neuroses of the female due wholly or in part to pathological entities affecting the uterus and its appendages, it is certainly surprising that more attention has not been given to analogous conditions in the male due to disturbances of the generative organs and especially of the urethra.

Taking as our point of departure the prostate body, we will find quite a close similarity between some of its morbid conditions and those affecting the uterus. Physiologically, the prostate, or at least a portion of it, is the homologue of the uterus, there being the closest resemblance in the muscular structure of the

two bodies. If the muscular tissue becomes perverted in growth, we have in the one, uterine myoma, and in the other, prostatic hypertropy, the structure of the two morbid processes being strikingly similar. When, as is occasionally the case, the "third lobe" of the prostate becomes so circumscribed as to form a distinct tumor, it is generally not unlike a pedunculated fibroid. It will also be found that certain remedies which have a pronounced action upon unstriated muscular fiber, have a somewhat similar action upon the prostate and uterus, this being especially true of secale, ustilago maidis, and hammamelis. Certain sedative remedies act very similarly upon irritative affections of the uterus or ovaries and the prostate. To carry the argument a little further and directly approach the subject of neuroses, it will be found that certain irritations affecting the prostate will produce effects quite like those produced by utero-ovarian irritation in women. False spermatorrhœa (spermatophobia) pseudo-impotency involving disgust for the sexual act, melancholia, hypochondria, neuralgias whether of the contiguous or remote nervous filaments, and nervous inhibition amounting to almost complete paresis, are all possible results of urethral or prostatic irritation, and these conditions are all represented by similar disturbances, such as hysteria and allied conditions in the female, due to morbid conditions of the generative organs. The analogy between the results of prostatic catarrh and those of cervical catarrh, as shown in one of the cases herewith reported, is sometimes especially striking.

One of the interesting features of stricture of the urethra is the ensemble of symptoms of a nervous character that is so often seen, and which neuroses are frequently entirely disproportionate to the degree of organic trouble present. Cephalalgia, neuralgia in various localities, particularly sciatica, lumbar and intercostal neuralgia, are quite common, but are probably regarded by both physician and patient as coincidences rather than as bearing any consequential

relation to the stricture. Associated with these are others (quite as prominent in some cases) of a purely mental character, such as melancholia, hypochondria, disturbed sleep, incapacity for intellectual effort, and deterioration of business capacity, perhaps associated with great irritability of temper. Disturbed digestion and general faulty nutrition are constant. That these various morbid conditions depend upon the stricture is never fully appreciated until that organic entity is cured, when the complete restoration to health demonstrates their true relation to the primary source of irritation. Many of my patients tell me that they had become so accustomed to their little ailments that they had come to consider them a matter of course and had never dreamed of their association with the stricture until the latter was cured. One of my patients remarked that he did not know how sick he was until he had been cured of his stricture.

Certain cases of gleet are associated with considerable mental depression which is commonly attributed to the moral effect of the supposed drain upon the system. This mental disturbance I believe to be in many instances the result of reflex irritation through the sympathetic system, which is so closely associated with the functions and nutrition of the sexual organs.

Morbid conditions of the urethra not only cause neuroses in other portions of the body, but they are often a reflex result of disease of contiguous structures; thus I have noted cases of spasmodic stricture dependent upon hernia and varicocele. Dr. Otis has described some very interesting cases of chronic spasmodic stricture of reflex origin. Operations about the anus are very often followed by spasmodic stricture and urinary retention. Morbid conditions of the anterior portions of the urethra often cause reflex disturbances of the deeper portion of the canal, or indeed, of the bladder. This is very familiar in connection with the results of contraction of the meatus.

One of the most annoying complaints which the surgeon is called upon to treat in connection with the

genito-urinary apparatus, and especially in stricture, is neuralgia and hyperæsthesia of the urethra. This disorder is most often the result of long standing urethral inflammation, or stricture with its attendant gleet, and frequently persists long after organic disease has apparently been cured. The majority of patients who suffer from urethral neurosis of this kind are either of an emotional and highly sensitive, nervous organization — often simulating "hysteria" in the male — or of a gouty temperament with highly acid and concentrated urine; anæmic and cachectic patients are especially liable to it if nervous or rheumatic. In such patients the imagination has been overwrought by the dread of serious results from urethral disease, and the mind depressed by a sense of self-degradation. The condition of the mind as well as that of the urethra has been impaired by long-continued treatment of something which although trifling in itself, perhaps, is to the patient a terrible morbid entity, and a mental incubus from which he is never free except during the hours of sleep Quack literature, irritating injections, over-enthusiastic treatment, sexual starvation and excitement without gratification, are all disturbing elements in his case, and if we superadd the results of dissipation, intemperance and dietetic errors, what wonder is there that he never gets well, or that he magnifies the slightest unusual sensation about his sexual organs into something new, serious and startling. Such patients will say to us when we try to convince them that their gonorrhœa, gleet or stricture is practically well: "But, doctor, I am not quite right. I have a funny feeling at this point in the canal," or the complaint will be varied by a description of severe burning or cutting pains in the canal during micturition, or a tender spot usually near the meatus. Sometimes the pain radiates to the other portions of the sexual organs. On examination with the urethroscope nothing appears which will account for the trouble; and treatment is usually of little avail, unless we succeed in

obtaining the patient's confidence and inducing him to believe that his trouble is not organic and will soon wear away—only too often, however, he goes from surgeon to surgeon in the vain endeavor to find relief, until despairing and disgusted he resigns himself to what he considers inevitable fate and lapses into confirmed melancholy and hypochondria. Great irritability of mind alternating with depression and melancholia. Morbid atates of the prostatic sinus and vesical neck with or without coexisting stricture occasionally give rise to urethral neuralgia; vesical calculus and tumors are especially liable to be complicated by it. Hyperæsthesia of the urethra is so often associated with stricture and gleet that it is worthy of consideration in every case in which obstructive spasm occurs during instrumentation; some canals will be found to be so hyperæsthetic that a chronic spasmodic condition exists. In some cases of chronic spasmodic stricture or urethrismus, local lesions of the mucous membrane exist, while in others nothing abnormal is to be detected.

Hyperæsthesia of the testicle is an interesting condition which sometimes results from reflex irritation from stricture; more often however it is due to excessive sexual indulgence or the opposite extreme, i. e., ungratified and prolonged sexual desire. It is most apt to be associated with cachexiæ, gout, neurasthenia or anæmia. The testicle may be relaxed and soft, or full and firm to the feel. Oftentimes varicocele is present and acts as an efficient cause for the affection. Hypochondria, melancholia and various mental perversions of a delusional character are not unusual, and may perhaps be associated with a sluggish portal circulation or dyspepsia. Sudden deprivation of customary sexual indulgence is said by Curling to be a frequent cause.

The symptoms consist in extreme sensibility and tenderness either of the entire testicle or some spot upon its surface. So exquisitely tender is it that oftentimes the contact of the clothing and the various bodily movements cannot be borne.

Neuralgia of the testicle is really an exaggeration of hyperæsthesia, and has in addition to hyper-sensitiveness, paroxysms of shooting cutting pain in the organ. The causes are much the same as for hyperæsthesia—syphilis, gout, and malaria having a prominent place in its ætiology. Urethral stricture quite often and prostatic and bladder disorders occasionally cause it. The pain is much like that of renal colic and is sometimes attended by retraction of the testis from spasm of the cremaster and the sick, faint feeling and cold perspiration characteristic of shock. I believe that some cases are really due to irritation of the renal pelvis and ureter by sharp crystals in the urine, and this acting reflexly produces pain in the testis. Usually only one testis is involved. As a rule the patient can walk about, but in the severe cases he is apt to be greatly prostrated, and in addition he usually suffers from pain and soreness on movement.

The treatment of the neuroses which have been presented consists in following some very plain indication as well as putting in practice numerous general principles. First and most important of all is attention to the patient's mental condition. His mind should be diverted from his physical ills, and at the same time kept free from all sources of sexual disquiet. Questionable literature and the society of loose women must be avoided; in short, an attempt should be made to correct the impression so prevalent among men, that man's chief mission upon earth is the procurement of material wherewith to cloy his sexual appetite. *Once dispel the idea that his penis and testes constitute the axis around which his earthly existence revolves, and one will have done more for his patient than if he had fed him the entire contents of a drug store.* Having allayed sexual disturbances of a purely mental or moral character, it remains for us to secure for our patient physical sexual rest, it being sometimes a matter of nice judgment to determine whether moderation or strict continence is best for the patient's welfare. In a general way it may be said

that those neuroses which are dependent upon or complicated by actual inflammation, acute or chronic, demand absolute continence, while in those of a purely nervous character, moderation is to be advised. It is always a hard matter to determine the degree of success of our prescription in this matter, as the patient's penis is not only quite liable to gain the mastery over his reason and judgment, but over his morals as well, and he will therefore be apt to consider that a lie to his doctor, like Rip Van Winkle's drink, doesn't count.

Second only to sexual rest is the correction of urinary activity. This may be corrected by diet and remedies combined, the diet being by far the most important. The proper standard for a suitable diet is bread and milk, but this may be varied within narrow limits. Nitrogenized food, stimulants and tobacco must be strictly prohibited. As an adjuvant to this regimen, the Turkish bath does excellent service.

The best remedies to correct hyperacidity of the urine, are the acetate and citrate of potassium, liquor potass., and in gouty or rheumatic patients (who are especially liable to neurotic symptoms from urinary disturbances) lithia, colchicum, and salicylic acid. Mineral waters are very useful, the Buffalo lithia and Waukesha waters being especially useful. Several of my patients claim great benefit from partaking freely of the Geneva magnetic water.

Sedatives and anti-spasmodics are often useful in these cases, the following being of service in different cases, viz.: potassium bromide, gelsemium, hyoscyamus, camphor monobromate, morphia, salix nigra and ergot. Tonics are often required, the best being the chloride of iron, strychnine, arsenic and quinine. In those rare cases of spasmodic stricture of malarial origin, quinine is of course a specific. Three very useful drugs are the phosphide and bromide of zinc, and the bromide of arsenic, these being great favorites of my own.

In many cases of urethral neurosis, surgical inter-

ference is required, thus a contracted meatus must be cut, a stricture dilated or cut, hernia or a varicocele operated upon or properly supported, etc. *The paramount indication from a surgical standpoint, is the relief of obstructive and inflammatory lesions of the genito-urinary tract.*

Cases of irritability and hyperæsthesia of the testes are by no means promising. The use of anodynes is ordinarily reprehensible, as the disease is chronic in character and a narcotic habit may be readily acquired. If hygiene, the steel sound, the suspensory bandage and marriage do not cure, the case is apt to be hopeless. Galvanism and the application of ice bags are said to be of service. Castration is not to be thought of, but the idea suggests itself to me that in an obstinate case, stretching the spermatic cord with incisions into the tunica albuginea might be successful in curing the neuralgia. Hammond suggests pressure upon the cord for the relief of the obstinate cases, upon the theory that in this way the sensibility and conductivity of the affected nerve fibers will be obtunded.

A very interesting case showing the great annoyance which may reflexly arise from slight irritation of the genito-urinary tract came under my observation a few days ago. A gentleman 28 years of age had been troubled by frequent micturition, especially at night, for some years. At times he would be compelled to rise four or five times at night to evacuate his bladder.

The only point in his history of any importance was a gonorrhœa some seven or eight years ago. He confessed to masturbation and sexual excess in times past, but stated that sexual apathy and incapacity had prevailed of recent years. On examination I saw a meatus which had been badly cut by some surgeon one year ago. Just within it was a very irritable and resilient stricture of a caliber of twenty Fr. Not a stricture perhaps, in the eyes of some surgeon, but a decided stricture in my opinion. This contraction was so irritable that attempts at exploration threw

the entire canal into a state of spasmodic contraction. I found it impossible to pass a bougie through the deep portion of the canal. Cocaine was applied and a meatotomy at once performed. As soon as the meatus was free, I passed a 32 Fr. solid steel sound into the bladder without the slightest effort. The night of the operation the patient had the first uninterrupted sleep that he had enjoyed for years, this experience being repeated every night following until he left for his home in the west.

We have here a case of vesical and prostatic hyperæsthesia, and chronic spasmodic stricture—urethrismus—instantly relieved by removing the reflex sources of irritation, a resilient irritable meatal contraction.

Another interestiug case of a somewhat different type is at present under my care. This case shows how posterior irritation may reflexly excite disagreeable symptoms in the anterior portion of the genito-urinary tract. A young man of twenty-five who had suffered from several severe attacks of gonorrhœa, presented himself to me complaining of severe burning and hot, lancinating pains along the pendulous urethra, localized at times at a point one inch posterior to the meatus. These painful symptoms were chiefly manifest after urination although present in the intervals. The patient was extremely neurotic and suffered from sexual hypochondriasis. Otherwise he was in a normal condition. The urine presented no pathological features, save *tripper fäden* and mucous casts of the prostatic follicles of the characteristic horse-shoe nail variety.

Examination with the bulbs showed a urethral calibre of thirty-four French, and an absolute freedom from contractions. There were several points of tenderness in the penile urethra, and excessive tenderness in the prostatic region. Rectal examination showed the prostate to be slightly enlarged.

I made the diagnosis of urethral neuralgia and hyperæsthesia dependent upon posterior urethritis and follicular prostatitis.

There was no cutting to be done, and the treatment therefore consisted of intermittent dilatation with large sounds, and the application of nitrate of silver solution to the prostate. These applications were alternated with the application of the continuous current, positive pole, to the deep urethra. Internally tonics were given, the Tr. ferri chlor. being mainly relied upon. The case has slowly but markedly improved, a fact which is particularly gratifying in view of the stubborness of such cases.

I wish to state in passing that I envy those surgeons who have such brilliant success in the management of this type of genito-urinary neurosis as is claimed by some. Personally I had rather see the gentleman with the cloven hoof walk into my office than one of these patients.

The explanation of the obstinacy of such conditions is to be found chiefly in faulty sexual hygiene, a matter over which we have but little control.

As illustrative of the interesting character of some of the cases described, I take the liberty of presenting the following, selected from my case book:

Case I. Reflex vesical irritability and intercostal neuralgia from contracted meatus. W. R., age 39. This gentleman had had numerous attacks of gonorrhœa in his youth, the last attack having occurred about fifteen years ago. Since this last attack he had been troubled with frequent micturition, necessitating his rising six to eight times during the night, and causing great irritability of mind. Micturition was occasionally quite difficult, requiring fifteen or twenty minutes for its completion, the stream being especially slow in starting. Every spring and fall and whenever he was overworked he suffered from a severe attack of pleurodynia, which had been variously diagnosed as pleurisy, impending pneumonia, cardiac neuralgia, intercostal neuralgia, etc. In two of these attacks in which I attended him, there was an elevation of temperature of about four degrees, with considerable prostration, leading me to believe

that the attacks were of a rheumatic character. On examination of the urethra, I found the meatus so small as to barely admit a small probe, and excessively tender and inflamed. A slight gleety discharge was noticeable, which the patient stated had been a constant symptom for years. I at once enlarged the meatus to 34 French, and attempted a thorough exploration of the canal. I found that steel sounds would not pass the muscular urethra on account of the intense spasm which they induced, soft bougies, however, passed readily up to 18 French. Above that size could not be passed without producing intense pain. No organic contraction of the canal could be demonstrated by either the urethrameter or *bougies a boule*. The second night after the meatotomy, the patient slept soundly for the first time in some years, and he has continued to secure his natural rest ever since, it being now three months since the operation. The flow of urine has become quite free, and starts as soon an attempt at micturition is made, the act of micturition being of normal frequency. A marked improvement in the general health is noticeable and the nervous irritability has in a great measure disappeared. There has been some increase of weight, but as the patient is naturally spare, this has not been very marked. The attacks of pleurodynia have not recurred, although the usual time for their occurrence has passed; and as time goes on, I am confident that the theory of their dependence upon the urethral irritation will be confirmed. The gleet has disappeared entirely, and there has been a decided increase of sexual vigor, in short, as the patient expresses it, he is "himself" again.

Case II. General sympathetic disturbance and neuralgia of the testes, from stricture of large caliber and follicular prostatitis.

J. G. R., aged 45. This gentleman had several attacks of gonorrhœa, the last one having occurred some twenty years ago. For the last four years he had been suffering with irritation of the urethra.

which had been referred to stricture, and treated by dilatation. Later on he had been "quacked" for diabetes, prostatic enlargement, Bright's disease, rheumatism, and several other afflictions, with no effect save to convert the patient into a confirmed hypochondriac. At the time he consulted me, he had been suffering from paroxysmal pain in the testes, with occasional "burning" sensations in the testes, perineum and cranial vertex, and pains of a rheumatic character in the limbs. On examination of the urethra I found that it would admit an 18 English sound quite readily, save some pain was experienced at a point one inch from the meatus. At this spot the *bougie a boule* demonstrated the existence of a linear stricture of large caliber. The prostate was found to be somewhat tender, but not enlarged. On examining the urine I found that it contained membranous shreds, which from their appearance I judged to be from the prostatic urethra, and the result of follicular prostatitis. A slight gleety discharge was noticed, evidently of a similar origin.

The meatus and stricture were cut to 40 French, with a complete relief to the neuralgia of the testes. The rheumatism in the limbs has greatly improved, but the feeling of heat in the testes, perineum, and head has in a measure persisted, although much better. These latter symptoms I attribute to prostatic irritation, more particularly because applications to the prostatic sinus, of a sedative or astringent character, produce a marked and speedy amelioration of them. I have found also that the shreddy appearance of the urine was increased by each application to the prostate. Hot boracic acid irrigation has been substituted for these applications, and the case is slowly improving. The connection between the neuralgia of the testes and the stricture in this case is demonstrated by the improvement resulting from urethrotomy.

Case III. Pseudo-impotence from contracted and irritable meatus. This case and case IV., I will not give in detail, but will present the salient points.

A young man of 27 had suffered from several attacks os gonorrhœa, the last of which ran into a gleet which lasted about a year. There had been no trouble with urination, but about six months before I saw the patient, he noticed a loss of sexual power. He would suddenly succeed in securing an erection at times, but erection would suddenly cease in the act of copulation. On examination I found the penis and testes apparently normal, but the meatus was quite narrow and excessively sensitive. There was no deep or penile stricture.

The meatus was incised to 34 French, and sounds passed to the bladder every third day for several weeks. At the end of a month improvement was reported, and in about two months the patient reported himself as entirely recovered from sexual disability.

Case IV. Vesical atony from contracted and irritable meatus.—This patient, forty years of age and a gambler by profession, gave the usual history of numerous gonorrhœas and also syphilis. Micturition had for a long time been attended by pain and smarting at the meatus, and a slight gleet had been present for some years. For about a year the stream had grown less and less forcible, until quite a strenuous effort was necessary to empty the bladder. On examination the meatus was found to be only moderately contracted, but very tender, the lips being everted and reddened. No deep strictures were discoverable. The feeble flow of urine through the catheter demonstrated the vesical atony. As the obstruction was only moderate and was congenital, the atony was explicable only upon the theory of reflex spasm of the cut-off muscle and inhibition of the detrusor urinæ. Meatotomy to 40 French resulted in an almost complete cure as demonstrated by examination six months after operation.

Many other cases of a neurotic character have occurred in my genito-urinary practice, but these cases will serve for the purpose of illustration. In all my cases, due attention has been paid to general hygienic

and medicinal measures, but the details of treatment would simply result in prolixity, without adding to the value of the report. I have found that reflex neuralgia of the testis, penis and cord and chronic spasmodic stricture are by no means rare, as several instances among my patents serve to demonstrate.

A CASE OF CIRCINATE PAPULO-ERYTHEMATOUS SYPHILIDE WITH PSORIASIS PALMARIS SYPHILITICA.*

Numerous observers have directed attention to a comparatively exceptional variety of papular syphiloderm, occurring in the secondary periods of syphilis, which assumes a form always closely resembling, and frequently precisely identical with, ordinary tinea circinata. Several beautiful examples of this form of eruption have come under my observation, the case shortly to be described being the most typical and clearly outlined of any that I have seen. One of the first cases that I encountered in private practice occurred in a young man who presented himself for treatment for several patches of what appeared to be ordinary ringworm, one of which was located upon the right cheek, and the other upon the opposite side on the neck. Decided pigmentation of these patches made me at once suspect that they were syphilitic, and I therefore made a careful general examination, with the result of discovering general lymphatic engorgement, a characteristic sore-throat and several mucous patches upon the tongue. Upon the roof of the mouth were several distinctly circinate, elevated, reddish patches, one of which presented the arc of a circle representing about one-half the size of a silver quarter; the other, a perfect circle, of the size of a silver dime. The borders of these circular patches were elevated and of a brighter red color than the normal mucous membrane. The center of the patches was normal or nearly so, the membrane possibly being rather paler than usual. The subsequent history of

*Read in the Section on Dermatology and Syphilography of the American Medical Association, June 9, 1892.

the case and its behavior under treatment confirmed the original diagnosis of circinate syphilide.

The case at present under consideration is a very interesting one, in that we have two varieties of le-

Fig. 1.

sions representing two different stages of syphilis and occurring within a short time after the inception of the disease.

The patient, a woman, twenty-four years of age, presented herself at my clinic at the suggestion of one

of my brother physicians. Four months before coming under my observation, she contracted a chancre. This was followed by a bubo and, in about two months, by what, from her description, was evidently a roseola, interspersed with distinct papular syphilodermata. The first generalized eruption had, according to her story, disappeared, with the exception of some of the papules upon the face and upon the palms of the hands. These lesions not only persisted, but had increased in number and prominence. Shortly after the appearance of the first eruption, several mucous patches in the mouth, and sore-throat developed. The woman had drunk considerably and admitted the cigarette habit, this circumstance amply explaining the obstinacy of the lesions under treatment and the persistence and severity of the lesions of the mucous membrane of the mouth and throat. There had been, she stated, considerable falling of the hair. Within three or four weeks prior to appearing at the clinic the woman stated that there had developed a generalized eruption on the face, which she thought was erysipelas, and which she feared would extend all over the face. On examining the patient, I found upon the face a number of distinct, circinate papular syphilodermata of varying size and form. Some of these presented the form of distinct circles; others were more or less crescentic in shape, and several of them were fused together somewhat like a figure 8. Upon the back of the neck, just at the roots of the hair, there were two quite large crescent-shaped lesions, one of which was nearly as large as half the circumference of a silver dollar. Upon each side of the face, beginning in front of the ear, which it involved, was a syphilide considerably larger than a silver half dollar, the periphery of which was distinctly raised, the center being perfectly healthy. A peculiar feature of these syphilides was the symmetry and their conformation in a general way to the outline of the ear itself. The elevated portions of all of these lesions were more or less scaly. The nose, upper lip

FIG. 2.

and chin were the seat of erythema, with abrupt edges, slightly, if at all, elevated above the surrounding skin. This erythema underlay a number of the circinate syphilides and extended out upon the cheeks and upwards over the eyebrows for a short distance. This erythema does not, I regret to say, show in the appended illustration. The mouth and throat were decidedly involved. The soft palate presented a distinctly circinate patch; the fauces were congested, and upon the right side an ulcerating mucous patch was observed. The tongue was the seat of several inflamed mucous patches. There was pronounced syphilitic adenopathy. The palms of the hands presented as fine an example of psoriasis syphilitica as one would care to see. This psoriatic eruption, as will be seen by the appended illustrations, was quite extensive and plainly marked. Under rigorous mercurial treatment, with regulation of the patient's habits, with local applications of mercuric chloride and tincture of benzoin, the facial eruption was speedily removed; that upon the palms was quite stubborn, persisting for several weeks after the erythema and circinate lesions had practically disappeared.

The circinate papular syphilide has been described as syphiloderma papulosum circinatum by Dr. George H. Fox* and Dr. I. E. Atkinson.† Jullien‡ describes it as *syphilide en cocarde.* Kaposi‖ also describes it as a variety of *syphilis cutanea.* Bumstead and Taylor¶ have described a flat variety of the papular syphiloderm which becomes elevated as a distinct ridge at the periphery or as an annular crest, of a dull yellowish color, at the periphery of an ordinary papule. These authorities also state that as papules retrogress, especially in late syphilis, the center of the lesion may be absorbed first, leaving a more or less scaly ring, which is itself firmly absorbed.

* Photographic Illustrations of Cutaneous Syphilis.
† Journal of Cutaneous and Venereal Diseases, Vol. I., No. 1.
‡ Maladies Vénériennes.
‖ Die Haut und angrenzende Schleimhaut.
¶ Treatise on Venereal Diseases.

Professor Atkinson's paper is illustrated by a beautiful example of the disease, occurring in a young negress, and is one of the clearest and most accurate descriptions of this peculiar form of syphiloderm. To this paper I am chiefly indebted for the description of the lesions.

Atkinson states that the lesions of syphiloderma papulosum circinatum develop essentially from the annular or circinate arrangement of the papulo-tuberculous lesions, so frequently seen upon the skin in late secondary and tertiary syphilis, each group representing a number of distinct and separate lines arranged in a circular form; whereas the circinate papulo-syphiloderm invariably begins in a single lesion (a papule), from which the lesion spreads as the primary papule itself disappears. Dr. Atkinson has had exceptional opportunities for observing negro patients, and states that this peculiar syphilide is especially frequent in them. I have had no opportunities to form an independent opinion upon this subject. Atkinson's description is as follows:

"In its milder and more limited development it affects preferably the face and neck, but when extensive, no part seems to escape it: back, breast, belly, thighs, arms, hands become invaded. Where the onset is acute and the eruption copious, fever may be present, and the lesions may form with almost the rapidity of those of the eruptive fevers. The lesions appear as bright or dusky-red discs, but little elevated in comparison to their breadth, and varying in size from that of a small pea to a diameter of two centimeters and more. Some remain without further development, or within two or three days begin to desquamate in thin, fine scales, beginning at their peripheries. This desquamation exposes either a dry, smooth, reddened, and flattened elevation, or a moist surface which speedily forms a thin straw-colored or brownish scab, flattened and depressed toward the center. After some days, these scabs fall off and leave pigmented spots. While these changes are going on

in some lesions, others exhibit a more curious but less intense activity. While the peripheries of these papules show a scanty, fine desquamation, their central portions gradually sink down to the level of normal skin, and their borders extend centrifugally. A short interval suffices to convert the former papules into unelevated central areas, surrounded by narrow but abrupt borders of elevation, forming continuous rings of infiltration and continually throwing off fine scales. Rarely, the eruption may be limited to a half-dozen of these spots, irregularly scattered over the face, neck and shoulders.

"The color of the central area will now be of a dusky-red color, slowly fading to a duller hue; while the border will be of a darker and more characteristic tint. The central area now continues to grow larger, and by the extension of the slightly elevated border all resemblance to the original papular lesion is lost. Instead, there is presented an appearance strongly suggestive of severe tinea circinata, which, indeed, it may so closely simulate that, without the previous knowledge of the patient's syphilis, the lesion may, upon superficial examination, be mistaken for ringworm. The elevated border will present a continuous narrow line of a slightly beaded appearance, and will throw off a fine branny desquamation. The central portion of the patch will usually resume its normal surface and thickness, but there will remain the deeper pigmentation; while its size will increase, and its shape will undergo modifications, altering the originally circular outline. In negroes, the ordinary pigmentation of the patches will be replaced by a simple increased intensity in the normal darkness of the skin.

"These patches may reach a diameter equal to that of a half dollar, and by the confluence of several, great irregularity of extent and outline may be attained. I have never seen any patch larger than the size just mentioned, nor do I know to what extent they may proceed if uninfluenced by treatment. It is likely.

however, that spontaneous involution would destroy the patch before a much larger extent could be gained. In many patches a curious recrudescence occurs in their centers, whereby a new papule forms, and imme-

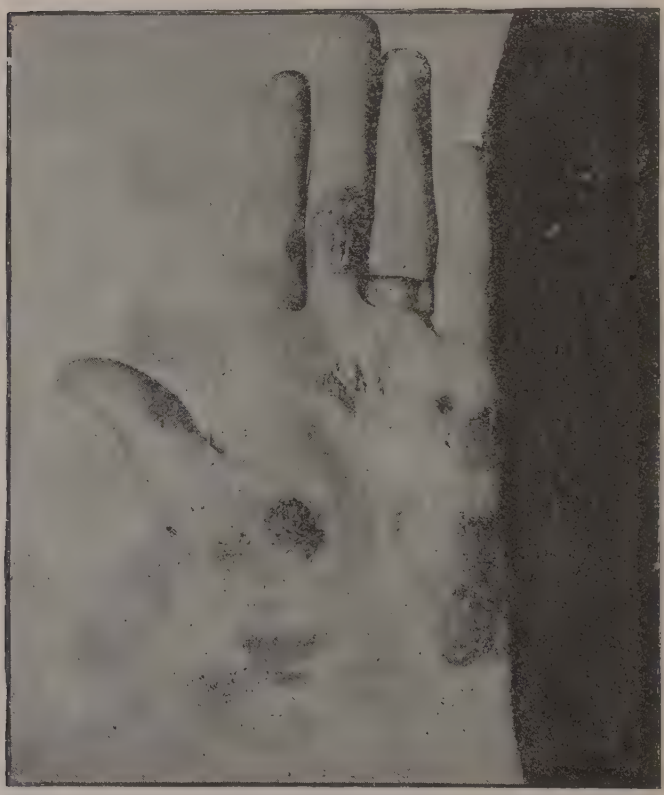

Fig. 3.

diately proceeds to follow the course of its predecessor in extending peripherally, though, it is true, the extending border rarely forms a complete circle, but rather a segment of greater or less size, and not so

sharply defined as the first one. Sometimes a third papule may develop within the pigmented inclosed space, and proceed to extend in the same centrifugal manner.

"But small provocation is required to convert these lesions into mucous patches, and when the axillæ or groins are invaded they readily become such. In a young woman, a negress, syphilitic eighteen months, the papular circinate syphiloderm developed within the buccal cavity, where the lesions, immediately becoming mucous patches, adopted the centrifugal extension, the narrow border assuming a pale, opaline aspect. Unlike the usual course of syphilitic cutaneous eruptions, this form, more especially when the rapid and excessive exfoliation of the epidermis lay bare the cells of the Malpighian layer, with the result of forming thin peripheral or general crusts, is often accompanied by a considerable amount of itching, as may be seen from the scratch-marks often present."

Perhaps the most interesting feature of my own case is the association of the circinate syphilide of the face and neck with the papulo-squamous syphilide of the palms of the hands, popularly known as *psoriasis palmaris syphilitica*. Such papulo-erythematous lesions as have been described are characteristic of the secondary period of the disease and may come on early; whereas the palmar syphilide, as seen in this case, usually occurs either in the period of sequelæ or as a late secondary manifestation. The condition illustrated is more marked than is the ordinary papular syphilide of the early stages of the disease, and it is much more obstinate to treatment. While, in the case at present under consideration, the lesions of the palms yielded comparatively easily to specific treatment, they were very much more tardy in disappearing than were the lesions of the face. They left, moreover, an erythematous surface corresponding in area and form with the original lesion, and relapse occurred within two or three months after the infiltration of the skin had completely disappeared,

as a consequence of dissipation and negligence on part of the patient. The rule that the circinate syphilide occurs in the early period of syphilis is not without exceptions.

FIG. 4.

Brauman* has called attention to numerous observations that show that in the so-called tertiary period of syphilis there may appear eruptions unlike most

*Thèse de Paris, 1891. Annales de Dermatologie et de Syphilographie, November, 1891.

tertiary lesions, which are deeply situated in the skin (tuberculo-gumma syphilides), in that they present a superficial character and may closely resemble the syphilides of the secondary period. These superficial eruptions of the tertiary period present themselves in two forms, viz., a superficial papular eruption, which is most exceptional, and an erythematous eruption of a pale-rose color, a little yellowish in parts, forming large circles, or more frequently lesions of an oval or elliptical form. To the latter form of eruption has been given the name *erythème circine tertiare.* This resembles a late roseola of the circinate form that has been called by Fournier *roséola de retour* and which may appear very late in secondary syphilis. This late roseola seems to establish the pathologic connection between the roseola occurring at the beginning of the secondary period and the peculiar circinate erythema of the so-called tertiary stage of the disease. In the superficial eruption described by Brauman, the lesion almost always presents itself as a simple erythema, without elevation, and there may exist a certain amount of desquamation of the very fine scales which tends to be very stubborn, even if well treated, and yields best to the mixed treatment.

Cases such as my own show that a distinct erythema more or less generalized, *i. e.* extending uniformily over quite an area of the skin, may be associated with distinct lesions of the syphiloderma papulosum circinatum. This case also shows something of a tendency to precocity, incidental, I presume, to the bad personal hygiene of the patient.

Stricture of the Urethra.

BY

G. FRANK LYDSTON, M. D.,

Professor of the Surgical Diseases of the Genito-Urinary Organs and Syphilology in the Chicago College of Physicians and Surgeons; Surgeon-in-Chief to the Genito-Urinary Department of the West Side Free Dispensary, Chicago; Fellow of the Southern Surgical and Gynecological Association and of the Chicago Academy of Medicine, etc.; Honorary Member of the Texas State Medical Association, etc. Lecturer on Criminal Anthropology in the Union Law School.

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ON

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GOUT.—Garrod, Ebstein and Weber and others attribute an attack of Gout to the accumulation of uric acid in the tissues. According to this statement, there must be a plugging up of the uriniferous tubules by urates, or the uric acid would be readily eliminated. Garrod also states that gouty people always have kidney disease, but a chemical and microscopical examination of the urine reveals nothing abnormal, only that just before an attack of Gout the urine has a very low specific gravity (1.010) and shows an absence of the normal nitrogenous constituents. But when the attack of Gout comes on, the urine becomes concentrated, of a high specific gravity, and is passed in very small quantities. The urine is very rich in nitrogenous compounds, and also contains a free or uncombined acid, to which we contend that the attack of Gout is due. —(See AMERICAN PRACTIONER AND NEWS).

This free acid is almost immediately precipitated from the urine of gouty people, directly after passing it. This acid is but sparingly soluble in water, but its aqueos solution has a decided acid reaction to litmus paper (which uric acid has not).

Its formula from an ultimate analysis is C.6 H.8 O.4 N.4 its molecular weight 200, and it contains 28.28 per cent of nitrogen.

The connection between Gout and this acid is as follows: This acid is but sparingly soluble in warm water, it is under certain conditions, such as a rapid change in temperature and exposure to cold, precipitated in the tissues. If this precipitation takes place in the muscular coat of the trachea and bronchus, we have asthmatic gout; if in the heart, we have cardialgi, with disturbances of the functions of this organ; if in the joints, we have arthritis.

Colchicin (C.6 H.8 O.4 N.4), as is generally known, is extracted from the meadaw suffron colchicum autumnal and has been used in Gout since the days of Hippocrates; Iodine compounds have also been extolled for the cure of this disease. Decandrin, is a modern alkaloid, being first isolated by C. J. Rademaker, M. D., in 1889, from phytolacca decandra (Linne). (See MEDICAL HERALD for April, 1889. Decandra (C.3 H.7 N.), molecular weight 57, is a volatile base, and is classed with the amines.

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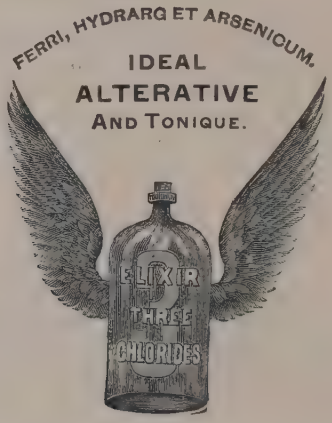
Elixir Three Chlorides



The Formula immediately suggests itself to the thoughtful physician.

INDICATIONS. — Anæmia from any cause, Struma, latent Syphilis, General Debility, Tuberculosis, Malaria, Loss of Appetite, Habitual Constipation, Chlororis, Chorer, Chronic Uterine, Pelvic, Zymotic, Catarrhal and Dermatological Diseases.

FORMULA. — Each fluid drachm contains: Proto-Chloride Iron, one-eighth grain; Bichloride Mercury, one hundred and twenty-grain; Chloride Arsenic, one two hundred and eightieth grain. With Elixir Calisaya Alkaloids and Aromatics.

DOSE.—One or two fluid drachms three or more times a day, as directed by the physician.

The physician may add without reservation any of the soluble iodides.

This combination of three of the most potent agents at our command, so markedly facilitates the action of each, that practice confirms what theoretically is an Ideal Alterative Tonic. Without tendency to derange the stomach or constipate.—SPECIFY R. & H'S.

Twelve-Ounce Bottles, Price $1.00.

RENZ & HENRY, DRUG IMPORTERS,

LOUISVILLE, KY.

Elixir Three Chlorides.

(Ferrum Hydrarg et Arsenicum.)

RENZ & HENRY'S.

Malaria, so-called Struma, latent or unrecognized Syphilis, may all operate in the same individual to bring about profound impoverishment of the red blood corpuscles. To meet this frequent multiple causation of Anæmia, we have been led to prepare from the old and well tried remedies a tonic which, we believe, will immediately appeal to the judgment and meet the approbation of physicians. Our Elixir of the Three Chlorides, containing as it does, the Proto-Chloride of Iron, the Chloride of Arsenic and and Bi-Chloride of Mercury in small *tonic* doses, seems to meet the indications as near as can be accomplished with our present knowledge. With the Arsenic and Calisaya we aim to combat the Malarial element so often met as a factor in Anæmia, while the small or alterative doses of Bi-Chloride of Mercury not only stimulate the glandular system and promote elimination, but, by so doing, are a powerful agent in reconstruction of the red blood cells.

At first glance many physicians will think the dose too small; however, we believe, on close thought, they will agree that to get the best results from either of the agents employed, viz:—the tonic and alterative effect—they should be given in small doses long continued. It will not color the teeth, is very pleasant to the taste, assimilated by the most delicate stomach, and harmless under prolonged use. Please specify Renz & Henry's.

Established 1832.

RENZ & HENRY,

DRUG IMPORTERS,

LOUISVILLE, KY.

LINES FROM TALENT

WORTH READING.

Elixir Three Chlorides—R. & H.

WM. F. KIER, St. Louis.
Recommends itself theoretically.

PROF. JNO. A. LARRABEE, Louisville.
The tripod of alterative medication.

W. T. HOPE, M. D., Chattanooga.
An irresistible formula.

A. M. CARTLEDGE, Louisville.
It's an ideal alterative tonic.

E. R. LEWIS, M. D., Kansas City.
I can personally endorse it.

T. J. WILLIAMSON, M. D., Eustis, Fla.
It's a chemical triumph.

PROF. G. FRANK LYDSTON, Chicago.
Is a reliable and open formula.

ANGELO FESTORAZZI, Mobile, Ala.
I hope its use will become more general.

C. M. CULVER, M. D., Albany, N. Y.
I have obtained the results I sought.

H. C. CROWELL, Kansas City, Mo.
The most valuable of all alteratives and tonics I have used.

W. TAYLOR EDMUNDS, M. D., Charleston, S. C.
I endorse this triumph in pharmacy.

E. M. McPHERON, Denver, Colo.
It has a broad field and will be highly satisfactory.

JAS. J. THOMAS, Youngstown, O.
Have found no remedy so efficacious in Anaemia.

C. C. PERRY, New York, N. Y.
As an alterative and tonic it cannot be too highly extolled.

T. PLAYFAIR LLOYD, Ocala, Fla.
I trust my professional brethern will not let it pass unobserved.

BENJ. H. GROVE, M. D., Buffalo.
I use it largely in my private and hospital practice.

E. CHRISTIANSEN, Leavenworth, Kas.
Better than words of the pen can express.

S. E. STRONG, M. D., Saratoga.
We employ no alterative combination so valuable in our sanitarium.

J. A. GILLIS, M. D., Baltimore.
In eczemas the results were more than I expected.

F. E. POPE, M. D., Honey Grove, Tex.
The most welcome medicament in gyneacology.

D. H. TAYLOR, M. D., Wheeling, W. Va.
It fills the place for which it is recommended.

DR. F. B. EISEN-BOCKIUS, Chicago.
As an alterative and tonic gives solid satisfaction.

EUGENE GRISSON, M. D., Denver.
Is entitled to the confidence of the profession.

W. B. STEERE, M. D., Des Moines.
Specially valuable in zymotic diseases.

ODELIA BLINN, M. D.,
Only good can result from this wise combination.

DR. HENRY J. REYNOLDS, Chicago.
I use it in dermatology with most gratifying results.

W. W. HESTER, M. D., Chicago.
Is convenient, scientific, progressive and not disappointing.

W. M. FUQUA, M. D., Hopkinsville.
As a stimulator of the histogenetic process I know nothing better.

E. J. GEISINGER, M. D., Unionville, Mo.
Responds with a positiveness and promptness rarely observed in remedies.

J. S. DOLSON, M. D., Hornellsville, N. Y.
Charmed and surprised at immediate benefit in pernicious anaemia.

LE ROY DOBBLE, M. D., Kansas City.
I am much pleased in specific keratitis and iritis.

JNO. S. HORNER, M. D., Hot Springs, Ark.
I have never been disappointed with its use.

F. M. WILSON, M. D., Bartow, Fla.
You may rely on me as a fervent advocate.

JNO. C. LE GRAND, Alliston, Ala.
Worthy the most favorable consideration.